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FRUIT-PACKING FOR MARKET

FRUIT-PACKING FOR MARKET

*A Practical Treatise on the Grading,
Packing and Marketing of Hardy Fruit*

BY
W. P. SEABROOK

With a contribution by
DUNCOMBE GIBBS

Issued by
THE WORSHIPFUL COMPANY OF FRUITERERS

With the Editorial assistance of
WALTER P. WRIGHT

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DEDICATION

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This handy and practical work is the outcome of an invitation by the Court of the Fruiterers' Company to the Chamber of Horticulture to make suggestions for furthering the Court's desire to publish a useful yet inexpensive book calculated to assist British fruit growers in meeting the competition from Overseas.

The work has been published at the cost of the Company, and is dedicated with grateful acknowledgment to

JOHN QUILLER ROWETT, ESQUIRE,
Past Master.

The Author begs to acknowledge his indebtedness to :

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PREFACE

THE Worshipful Company of Fruiterers has for many years past taken a keen and practical interest in the promotion of home fruit-growing.

It has organised shows, and issued books and pamphlets dealing with technical questions.

Prominent among its publications is "Profitable Fruit Growing for Cottagers," by the late Mr. John Wright, V.M.H., of which 32,000 copies have already been sold, and which still remains in active demand.

Another work, by Mr. Lewis R. Castle, was devoted to the present subject, and remained a standard textbook for many years. Ever changing conditions, however, have brought about the need for fresh treatment of this most important matter, and therefore, after consultation with the Chamber of Horticulture and the Federation of British Growers, an entirely new book was decided upon. It is published herewith in the hope that growers, enjoying the full light of modern knowledge and with the latest information before them, may be able to deal successfully with what is perhaps the least generally understood part of their business, namely, effective, economical and profitable distribution.

Matters of organisation have received special consideration by the Company, and in this connection it

may justly be claimed that the finest service ever done to the Fruit Industry was the summoning of the Guildhall Conference on February 22nd, 1918, which the Company arranged in collaboration with the old National Fruit Growers' Federation. The Conference was followed by a banquet at the Mansion House, at which Lord Ernle (then Mr. Prothero and Minister of Agriculture) urged various reforms in organisation, one of the most important being the establishment of a Horticultural Advisory Committee, composed of members of the Industry accredited by the various organisations, whose function should be to advise the Ministry on all technical matters. This Committee came into being, and is now the Horticultural Advisory Council of the Ministry of Agriculture and Fisheries. Thus for the first time organised Horticulture was admitted to the councils of the Government department which is responsible for the national interests in Horticulture.

A number of other important resolutions were discussed and dealt with at the Conference referred to, with the result that so active a movement for the resuscitation of growers' organisations took place, that to-day nearly 10,000 fruit growers and market gardeners are united under the Federation of British Growers and through its affiliated associations.

It is only by effective organisation and united action that any reforms of real value to the Industry as a whole can be brought about. The incidence of price control during war-time gave an enormous fillip to the banding of growers together, and the advantages of cohesion became so obvious that further progress was rapidly

made. The position so gained must never be lost. Growers must not be allowed to fall back into that apathy which was so fell a disease before the war, and which made organisation so difficult.

The bringing together of the leading growers in the country, which was effected by the Company's Guildhall Conference, had a further important and valuable result, for it brought about the formation of the Chamber of Horticulture, a process in which the Court of the Company took an active part.

It is hoped that the Chamber, comprising as it does the leading representatives of Horticulture, will prove itself to be a force of the greatest value in the promotion of fruit culture, and that all who are interested in this, as well as in other branches of activity, will derive benefit from its assistance. By disseminating knowledge and advice, and by affording help and protection where the interests of the grower, the trade, or the consumer, are injuriously affected, it can do yeoman's service to the trade and the community.

The Company feels that the ball is now at the feet of the growers, and would view with the keenest regret any relaxation of effort on their part. The future depends largely on the support which is given by the growers to the active organisations now in being, not only in the form of subscriptions, but also—which is nearly as important—in helpful, practical suggestions, criticism and advice.

Such aid given to their brothers who are voluntarily devoting time and expert knowledge to the effective working of these organisations must inevitably contribute to the success of the Industry as a whole.

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CHAPTER I

THE EVOLUTION OF MARKETING

Special Fruit Areas—National Uniformity—Overseas Methods—Honesty the Best Policy—Exports—Low Grades—Evils of "Topping."

THE present conditions of marketing have gradually evolved from those which prevailed when all produce was grown locally and for local consumption. At that early stage any package sufficed which was capable of carrying the produce a few miles. Uniformity in shape, material, and weight were of little importance. The result was that each district throughout the country used different packages, and pursued different methods of packing, weighing and measuring the produce.

Then came the establishment of special fruit-producing areas—for example, Kent and Middlesex supplying London, largely by road transport, the Vale of Evesham supplying Wales, the West Midlands and the North, and the Cambridgeshire district supplying the East Midlands and the North. This brought about a certain degree of standardisation of packages in each district. A further and final stage in the process of evolution is now developing, namely, the establishment of National uniformity in packages, packing, weights and measures.

Old customs die hard, and, whilst many packages which are in existence at present are of no more than local use, others have a wider value, and very careful discrimination has to be exercised in selecting permanent units for a National scheme. Nevertheless, the task must be accomplished if home-grown fruit is to compete with and reduce the great hold obtained in our markets by imported produce—a hold which has been rendered possible only by an organised system of marketing, the salient features of which are standardised packages and methods of packing, and guaranteed weights and qualities.

Advantages Enjoyed by Home Growers.

If the overseas grower has successfully overcome local prejudice at his end, and also met the divergent views and fancies of our own markets, surely home growers, by adopting corresponding though not necessarily identical methods, can dispose of our produce to greater advantage than at present. It must be remembered that our proximity to the consumer and our undoubted capacity to supply him with the best fruit which the world can produce are strong points in our favour. Add to these our abundant outlets for the lower grades, which are saleable only in a limited degree abroad, and our more plentiful labour, and the case is strengthened.

If the home grower will only utilise the advantages indicated, his success is assured. Let him reflect that although British fruit is the best procurable, and that Dominion and foreign fruit has an enormous distance to travel, yet the latter sells best. What is

the secret? It does not lie so much in the choice of a particular package, as in the fact that the merchant, the retailer and the consumer all know by a glance at the label what each package contains, both as to quality and quantity; and not only so, but they can rely upon getting other packages of the same quality and quantity if they want them. Home growers have really no other course to adopt than to organise similar methods if they are to regain and extend the home markets.

Let us summarise the salient features :—

- (1) Really good fruit.
- (2) Guaranteed sizes, weights and quantities.
- (3) Perfect grading.
- (4) Large bulks of new varieties.
- (5) Uniform standard non-returnable packages.

Opportunities for an Export Trade.

British growers are not restricted to the home markets for outlets for high grade produce, and THERE IS NO REASON WHY THEY SHOULD NOT ALSO ESTABLISH A LUCRATIVE EXPORT TRADE.

This country still has one of the finest mercantile fleets in the world. British growers have direct sea communication with practically every foreign market, and they have the advantage of a different season from other large fruit-eating countries. Let us only adopt progressive methods, and we shall find excellent markets abroad as well as at home. It is a fact worthy of note that much fruit intended for other countries comes first to our ports, and is then re-consigned and re-shipped. We are really the fruit brokers for many parts of the world.

Exporting Apples is not an entirely new thing to British growers ; it has been carried on in a comparatively small way for many years, and there is no doubt that with reasonable freights it can be largely extended.

Many salesmen receive regular enquiries for the export of Apples, but owing to the difficulty of obtaining properly packed and reliable fruit, they are generally unable to pursue the matter. As soon as the standard Apple box, packed on the lines laid down and described in Chapter II., is generally adopted, an export trade will follow naturally, and its development will be rapid. Most of our large salesmen are familiar with the imported boxed Apple, and they will only be too glad to open up such a promising avenue of distribution as an export trade for British Apples, thus relieving our congested markets during the full tide of a good Apple season.

The consumption of fruit in the United Kingdom has increased enormously during late years, and we could consume all the fruit that could be grown here if we had the means of holding over the surplus of one season to meet the scarcity of the next, and were competing on equal terms with imported produce. But holding over surpluses is not easy, and an export trade could be developed more economically. If the Industry is to thrive at a rapid rate, and take full advantage of its opportunities, then an export trade must be established.

Disposal of Low Grades of Fruit.

It is to every grower's interest that low grades should as far as possible be kept off good markets and confined to markets specially adapted to and catering for

such produce. Poor fruit lowers the value of better class stuff.

Jam manufacturers utilise a very large quantity of Apple pulp, and at present import it in huge quantities from every Apple-growing country. Our low grade fruit could be used for this purpose equally well.

Cider should be popularised, and cider-making should be developed on a large scale. Specially grown cider varieties are naturally the best for the first grades of cider, but most Apples will make palatable cider, and large quantities of the low grade Apples from the eastern counties are utilised for this purpose. Apple rings, canned Apples, dried Apples and bottled fruit must all help in absorbing low grades. By the term "low grades" is not meant unsound fruit, but fruit which is not large enough for market, or is ill-shapen or unattractive in appearance.

It may be taken for granted that growers may by their own efforts greatly improve sales, and it may be worth while to diagnose at the outset some of the ills from which home-grown fruit suffers.

Dishonest and Careless Packing.

Firstly, the evil of "topping" claims attention. One constantly hears references of a humorous character to it, such as "putting the best side to London," "what the eye doesn't see the heart doesn't grieve over," and so on *ad nauseam*. A large advertisement issued by a well-known publicity house actually started thus, "Like the Apples on top of the barrel . . . is not what it appears. . . ." All this sort of thing must

end, for a damaging impression is left on the mind of the public. British fruit must be so packed as to be absolutely reliable, so that buyers may be able to deal without doubt or question. It is little use advertising a commodity unless it is of good value. The many articles which are so heavily advertised to-day are world-known, and world-bought, not merely because they are heavily advertised, but because they are good value for the money which the buyer expends on them.

When the buyer of fruit does not know the character of the grower, and does not recognise his mark or guarantee, he assumes that the package is "topped," in other words, that there is better fruit on top than below. He makes due allowance for this, and often in doing so reduces the value of the whole consignment. He knows the regular "topper," and that over-cunning person suffers in exact proportion to his "topping" propensities. Unfortunately, however, the grower who "tops" damages the reputation of many honest packers and is a danger to the whole Industry. This is not merely an expression of business morality, but of sound common sense.

There is also the careless packer. The man who puts all sizes, sorts and conditions of fruit in one package is almost as culpable as he who deliberately packs dishonestly, at any rate the effect is the same, in that it reflects adversely on the whole Industry. Of course, in a few local instances retailers ask for ungraded stuff, but under wholesale market conditions, with which the present work deals, it is taboo.

Badly filled packages, those containing less than the quantity which the label or package indicates, and

"slacks," are all "below par," and unsuitable for good markets. If produce does not warrant good packing it should not be sent to any open market for disposal.

Confidence Between Grower, Salesman, and Buyer.

It should be the aim of every individual grower, however small, to establish a reputation for his fruit. At the start a small grower may suffer slightly from the limited quantity which he sends, and even have the mortification of seeing his sound and honestly packed fruit fetch no more than that of the grower who systematically "tops," yet gradually his reputation will grow, and his salesmen will learn to place his fruit to the best advantage. Every salesman has certain customers who will only take the best, or insist upon net weights, and who have learned by experience that they can confidently leave their salesmen to send them what he knows will suit their class of trade. This type of buyer is worth catering for. The salesman is sure of a good outlet for soundly packed fruit. On the other hand, indifferently or dishonestly packed stuff has to be sold to any chance customer at any price that it will fetch.

Most of our large markets are not depôts for the reception of fruit to be sold locally, but are clearing houses which supply the whole country, and an enormous proportion of the produce which they receive is at once sent far afield. A great deal of the fruit so handled is not seen by the retail buyer, who relies upon the salesman or wholesale buyer, and equally the latter must be able to rely upon the grower. If the grower

maintains a definite standard in his packing, it is unnecessary to inspect his packages and business is greatly facilitated.

Growers of hot-house fruit and vegetables furnish an example that the grower of hardy fruit might well follow. Such things as Tomatoes, Cucumbers, and Grapes are packed on standardised lines, with net weights or counts, and every grade is indicated by different-coloured paper.

This system was instituted by a few of the largest growers of glass produce in the country, and has gradually been adopted by all others, so that little is left to be desired in the methods of marketing adopted.

Probably the reason for this efficiency lies in the fact that the glass business is a specialist one, whereas unfortunately, hardy fruit is often handled by local "orchard buyers," and dealers who have little interest in the sound development of commercial fruit-growing. Moreover, hardy fruit is produced by such different classes of growers as farmers, smallholders, market gardeners, private gardeners, and amateurs, as well as by the fruit-farmer proper, and it is exceedingly difficult to induce all these various classes to adopt a standard method of marketing. The situation is made worse by the fact that many grow fruit as an unimportant casual "side-line." In some cases it might be said that the fruit "grows itself," and, judging by its appearance in the markets, no more thought or care is exercised in its picking, packing and marketing, than in its cultivation.

CHAPTER II

A SCHEME FOR A NATIONAL SYSTEM OF GRADING AND PACKING

Standardisation and Guarantees—Federation of British Growers: A Grading and Packing Schedule.

THE question of the adoption of a National System of packing and grading fruit for market has exercised the minds of growers' organisations for several years.

A scheme was drafted in 1917, but the period of controlled prices and other war conditions which followed delayed its appearance until 1921, when the Federation of British Fruit Growers (amalgamating the National Fruit Growers' Federation and the Market Gardeners', Nurserymen's and Farmers' Associations, and comprising nearly 10,000 growers) instituted the scheme described herein.

At present attention is concentrated on Apples, owing to the urgency arising from the heavy foreign competition in that important fruit, and a schedule has been drawn up, which has been approved by wholesale and retail distributors, and has received the approval of the Ministry of Agriculture and Fisheries. The scheme comprises the standardisation of grades, sizes, selling units, and packages, a registered trade mark

label, provisions for ensuring the carrying out of the guarantees, and a list of the varieties of Apples to which the scheme is confined. Similar schedules are also applied to all other important commercial fruits.

The salient points in the scheme are : (1) guaranteed net or minimum weights or counts, and (2) a registered trade mark label.

The first will remove the necessity for the retailer offering a low price to discount the possible short weight, he having to buy by measure and sell by net weight ; and the second will advertise the contents as being up to standard.

Federation of British Growers.

Schedule 1.

- (1) APPLES : *Special Dessert*.—Varieties such as Cox's Orange Pippin, Rival, and Chas. Ross.

Quality.—Perfect fruit only. Uniform colour and size.

Grade.—Min. diam. $2\frac{1}{2}$ ins.

Package.—Peach box, $17\frac{1}{2}$ by $11\frac{3}{4}$ by $4\frac{1}{2}$ ins. inside measure.

Sale by count.

- (2) APPLES : *Dessert*.

Quality.—Colour even throughout package ; sound ; without any blemishes affecting keeping or quality ; skin blemishes not to exceed 10 per cent. of the Apples ; evenly sized ; min. diam. 2 ins.

Grades.—Sizes 2 to $2\frac{1}{4}$ ins., $2\frac{1}{4}$ to $2\frac{1}{2}$ ins., $2\frac{1}{2}$ to $2\frac{3}{4}$ ins., $2\frac{3}{4}$ ins. to 3 ins., 3 ins. and over.

Packages.—British Standard Box, 18 by 11½ by 10½ ins. inside measure.

Bonnet.

Half-bushel sieve.

(3) APPLES: *Cooking*.

Quality.—As for Dessert Apples; min. diam., 2¼ ins.

Grades.—Sizes, 2¼ to 2¾ ins., 2¾ to 3¼ ins., 3¼ ins. and over.

Packages.—British standard box.

Half-barrel.

Barrel.

Half-sieve.

Bushel sieve.

Under (2) and (3): Every package to be well lined. All wicker packages to be lined with stiff paper. Every Apple packed in British Standard boxes to be diagonally packed and separately wrapped. All fruit tightly packed. Stalk to cheek pack not allowed.

Each package to contain one variety and one size only, and to bear the name of the variety. ; F.B.G. Label; weight (or count) and grade.

Sale (a) Boxes—count or net weight, or minimum net weight.

(b) Bonnet, half-bushel and bushel sieves—tightly packed in layers. Net weight or minimum net weight.

Half-barrels and barrels—tightly packed.

Net weight or minimum net weight.

All these conditions only apply "WHEN PACKED."

Recommended standard sizes of empties (inside):—

Half-bushel, diam., 15 ins., depth at side, 8 ins., depth in middle 7 ins.

Bushel sieve, diam., 17 ins., depth at side, 10½ ins., depth in middle, 9 ins.

Half-barrel, diam. at top and bottom, 15 ins., middle, 17 ins., depth, 16½ ins.

LABELLING INSTRUCTIONS (APPLES AND PEARS).

British Standard Box : Large F.B.G. Coloured Label to be pasted on one end of box.

Peach Box : Large or small F.B.G. Coloured Label to be placed loose inside. When corded in fours the F.B.G. tie-on Label to be used.

Half-Barrels and Barrels : Large or small F.B.G. Coloured Label to be attached to lid of half-barrel or barrel. If tied over (not lidded) to be labelled as for sieves and half-sieves.

Sieves, Half-Sieves and Bonnets : Large or small F.B.G. Coloured Label to be placed loose in sieves over covering, but under sticks or string. Tie-on address label of colour indicating grade to be attached to package.

TIE-ON LABELS FOR SIEVES AND HALF-SIEVES.

Dessert : Grade 2 to 2¼ ins. (Pink and White).

Grades 2¼ to 2½ ins., 2½ to 2¾ ins., 2¾ to 3 ins., 3 ins. and over (Pink).

Cooking : Grade 2¼ to 2¾ ins. (Blue).

Grade 2¾ to 3¼ ins. (Pink and White).

Grade 3¼ ins. and over (Pink).

Rules and Regulations of the Grading and Packing Scheme of the Federation of British Growers.

1. Growers who are members of the Federation of British Growers shall sign an undertaking to conform strictly to the provisions of this scheme before using upon their produce the F.B.G. registered trade mark. The use of the said mark is intended to convey to purchasing retailers that the produce in connection with

which it is used is grown within the United Kingdom and Channel Islands.

In the case of use of the Mark upon any other products the Committee shall have power to expel the offending member from the Federation of British Growers or inflict such lesser penalty as they shall think fit.

2. Any grower who is a direct member of the Federation may participate in the scheme without payment either by way of entrance fee or annual subscription. Any grower who is a member of an affiliated association shall pay an annual subscription of Five Shillings.

3. The scheme shall be controlled and administered by a Committee, to be known as "The Grading and Packing Committee," elected by the National Council of the Federation of British Growers. The Council may elect to the Committee not more than six growers who are not members of the National Council.

4. All produce that is marketed in packages bearing the F.B.G. Label must conform to the Schedule and Regulations as regards the grading and packing.

5. Members may place on the label or package such private marks as they desire, providing that such marks are in addition to, and not contrary to, the particulars as required by the scheme.

6. Members have absolute freedom of market.

7. All labels must be obtained from the Federation of British Growers.

8. The Federation will accept no liability in regard to the action of any member in the event of disputes between any distributing agent and grower.

9. The Grading and Packing Committee cannot receive for consideration any complaints that may arise, unless :—

Complaint is made by some official organisation ; and not until it has been proved that the packages have not been tampered with or damaged in transit, or altered in any way beyond the grower's control ; and not until the grower and distributor have attempted mutually to settle the matter.

Provided that in pursuance of the intention of the Federation to institute a system of control over the proper use of the Federation of British Growers' Mark, and the due observance of the provisions of this scheme, the Committee may at any time call upon any member to furnish them with all necessary information, documentary or otherwise, in order to ascertain whether the obligations of members are being duly complied with. To this end officials of the Federation, duly authorised thereto in writing, shall have power at all reasonable times to examine and take samples of any produce of members on offer for sale. The Committee shall have power in the case of discovered infractions to expel the offending member from the Federation of British Growers, or inflict such lesser penalty as they shall think fit.

10. In the event of the Grading and Packing Committee finding that the grower has contravened the rules and regulations the Committee shall be empowered to prohibit the defaulting party from using the F.B.G. Label after the date of such decision and they may call

upon such a party to return all unused labels in his possession. If any party to a complaint is dissatisfied with the decision of the Grading and Packing Committee, the complaint shall be referred to arbitration by a panel of growers, wholesalers and retailers, to be appointed by the National Council. The decision of the panel shall be final and binding on all parties concerned.

11. The Grading and Packing Committee may publish in the Trade Press the names of those growers who are entitled to use the Label, and will keep a register of those names, which may be open to inspection under the regulations to be made by the Grading and Packing Committee.

12. Notwithstanding any of the foregoing provisions, the Grading and Packing Committee shall have power to grant licences for modification in packages and varieties for a period not exceeding six months.

Lower grades will be sold in the ordinary way without the Federation Label.

It will be seen that members may market their produce in whatever market they wish, but the Trade Mark is the property of the Federation, and can only be obtained and used by members of the Federation.

Growers who wish to take advantage of the marketing scheme, and who wish to become members, may obtain particulars from the Secretary, Federation of British Growers, 18, Bedford Square, London, W.C.1.

The scheme benefits small growers, because, provided the fruit is properly packed according to the regulations, the Trade Mark confers the same privilege upon the small consignment as the large.

CHAPTER III

THE PRESENT SYSTEM OF DISTRIBUTION

Methods of Access to the Consumer—Markets as Clearing Houses—Necessity of the Middleman—Good and Bad Salesmen—Co-operative Markets—Help for Small Growers.

IT may be well to outline the present system of fruit distribution in this country, ignoring such special methods as prevail in certain districts, where local growers and local retailers make their own arrangements.

Speaking generally, it is not possible for the grower to distribute his produce economically direct from the farm to the consumer. There are cases of local direct distribution, but they form an insignificant part of the national movement, and need not be considered herein.

A consignment from the grower's farm reaches the consumer in one of three ways :—(1) It may be sold by the salesman direct to a retailer ; (2) it may be sold to a dealer who buys for a group of wholesalers or retailers in the same market or elsewhere, or (3) it may be sent direct to a place of which the salesman has cognisance in order to supply a shortage.

Market Systems.

Many of the large growers sell their produce wholesale, and are thus their own salesmen. They have their own stands on the markets and their own staffs. They are, however, in the minority, owing to the difficulty of supplying buyers with consecutive supplies all the year round. They consist mostly of persons who grow a very wide range of produce. Even so, many of them are unable to grow all their requirements, and have to buy produce in order to maintain their connections, thus becoming merchants in a sense.

Our great markets are not, then, merely receiving stations, but are important despatching depôts to all parts of the country; and perform the functions of clearing-houses or exchanges. They are largely engaged in the supply of produce to jam manufacturers, and in export work on behalf of the growers.

It will be seen that our system is an intricate one. It has grown up from very small beginnings, absorbing an enormous amount of capital in the process. It possesses its own intelligence bureau, and commands some of the most capable business brains of the country.

Whether the market magnates are over-paid for their services to the grower or not, and whether the middleman takes more than a fair share of the proceeds of the sales or not, are perhaps debatable questions. Certain it is that these agents cannot be dispensed with. The services which they render to growers in distribution are essential, and as long as these services are efficiently performed, on the fairest terms that the grower can secure, there need be no dissatisfaction. Here it may

be mentioned that the grower who complains of unfair treatment is very often to blame himself, because he puts difficulties in the way of distributors by careless, dishonest or unbusinesslike methods.

Salesmen.

It is prudent to make the personal acquaintance of the salesman who is selected to handle one's produce. It is, of course, necessary that he should be financially sound and bear a good reputation. Ask to be allowed to inspect the sendings of his best growers. Extract from him all the information he can give as to the best type of package and the best method of putting up the produce. Show the salesman that you are anxious to work honestly and loyally with him, and in ninety-nine cases out of a hundred he will do his best for you. Too often the salesman is afraid to give advice because he is afraid of offending the grower.

The procedure advised is a reversal of the common method of marketing produce. Many growers like to pack according to their own ideas, and scorn to consult the person who has to sell the produce: then when the returns are unsatisfactory they blame the salesman instead of themselves. If every grower would only go to one of our large markets and see the hundred and one different types of produce and of packing he would wonder how on earth the stuff gets sold at all. It is not suggested that the fault is always on the grower's side; there are careless and unscrupulous salesmen in the fruit industry as in most other industries; but it is certainly the fact that much misunderstanding between grower

and salesman could be averted by a few minutes' personal discussion, with plain speaking on both sides.

There is little need for any grower to be swindled if he takes ordinary businesslike precautions, particularly in making proper enquiries before choosing a salesman. There are many abuses in our present system of wholesale distribution, but the largest and best salesmen are alive to them, and are doing their best to suppress them.

Co-operative Packing Stations and Markets.

A development that might well be considered by growers is the establishment of Co-operative Packing Stations, the output of which could be distributed through existing channels. Some such organisation would be of great assistance to groups of small growers, who find it uneconomical to market their produce individually. The plan is adopted with successful results Overseas.

A further step in advance would be the establishment of more Co-operative Markets, conducted by growers for growers. There are several such in existence to-day, and they are most successful. The movement is an excellent one, and its development would improve the position of growers greatly, always provided that the same care was taken in grading and packing produce as in other systems of distribution. It should be noted that the establishment of Co-operative Markets means much devoted work and unswerving loyalty from all the growers who participate. Without them success is impossible.

Pershore Co-operative Market.

As an incentive to growers in other districts, the following remarks on the Co-operative Market at Pershore, by Mr. Duncombe Gibbs, a member of the Market Managing Committee, are published :—

“ A grower who has gone to considerable trouble and expense in order to produce first-class fruit, and to present it in an attractive selling condition, naturally desires to complete the cycle of operations by marketing his goods with the minimum of cost, trouble and risk. The common methods, such as sending away to distant markets, or selling in bulk free on rail, keep the grower in varying states of uncertainty until the transactions are completed and payment has been received.

“ It is claimed on behalf of Co-operative Markets that the ordinary risks of business are greatly modified, that payment is prompt, that risks of delay and damage to goods in transit by rail are to a large extent eliminated as far as the grower is concerned, that the disposal of produce is completed with the least possible work and trouble, and finally that the cost of marketing is relatively low.

“ The first Co-operative Fruit and Vegetable Market to be established in this country was the Pershore Co-operative Fruit Market. It was not established without a struggle, as the growers of the district were not as a whole too ready to take up shares or to promise supplies of produce. Thanks, however, to the efforts of some growers, and to certain outside financial assistance, the Market was started with a capital of £916. Following certain initial difficulties, which were success-

fully surmounted, premises in Pershore were acquired, and the necessary accommodation was provided.

“ For the first few years all the produce sent in was sold by auction, and at the present time the bulk of the fruit and vegetables, as well as eggs, butter, rabbits, poultry, etc., are still sold in this way. It gradually came about, however, that the quantities of Plums, the chief crop of the district, were so large that other means had to be devised for their disposal. For some years a Forward Auction Sale was held, with fairly satisfactory results, but it was found inadequate and was eventually abandoned. Instead, the Market arranges contracts with jam manufacturers and other very large buyers, and the fruit is loaded at the railway station.

“ There is also a system of contracts for all kinds of fruit and vegetables, and this is not only a convenience to the larger growers, but it also relieves the auction market of considerable bulks of produce. In both these cases the grower has merely to make his contract to the Market, and load the produce; everything else is done by the Market, including of course the important matter of supplying the empties. The Market will deal with the produce of any person who cares to send, and the same treatment is given to the man with a cottage garden as is given to the man with hundreds of acres.

“ The holding of one share of £1 constitutes membership of the Market, and until recently this small holding entitled the holder to a share of the profits in proportion to the value of the produce sold for him during the twelve months.

“ The expenses of the Market are chiefly met by the charge of $7\frac{1}{2}$ per cent. commission for selling. Experience has proved that this, with a charge for the hire of returnable empties, is sufficient to pay 6 per cent. (originally 5 per cent.) per annum, on the share capital, to pay a commission to the manager in addition to his salary, and to pay a 5 per cent. bonus to the employees of the Market proportionate to their fixed remuneration.

“ After placing one-fourth of the surplus then remaining to Reserve Account, there has been sufficient left to pay a bonus to the members. This bonus varies from year to year according to circumstances, but it has seldom been less than $1\frac{1}{4}$ per cent., whilst it has been as much as $4\frac{1}{4}$ per cent. The higher figure meant that the member had his produce sold for $3\frac{1}{4}$ per cent. commission, and escaped the charges for tolls or portrages which prevail in many markets of the ordinary kind. In future, the conditions of the bonus will be modified, and a member must qualify for payment of the full amount of the bonus by holding one share of £1 for every £10 worth of produce sold for him. This is designed to prevent a grower using the services of the Market and taking large supplies of empties without supplying the proper proportion of capital.

“ The Market maintains a large stock of returnable empties in the form of pot and half-pot hampers and sieves. These are the property of the Market, and bear the well-known Trade Mark of four cross P's, which stand for Pershore Produce Properly Packed. Herein lies one of the secrets of the success of the Market. From the very first a strenuous endeavour has been made to compel every grower using these empties to,

firstly, be honest in his packing, leaving the practice known as "topping" alone; and secondly, to conform to the scale of weights laid down by the Market. The result has been satisfactory, and it is exceptional for the rules to be disregarded. It may here be noticed that in these essential respects Pershore Market has been doing for years what is now being urged upon growers in all parts of the country.

"In regard to returnable empties, the Market, like all others having such supplies to maintain, finds this branch of its activities the most expensive and troublesome. The outlay, which constantly recurs, cannot well be met by the hire charge of 3d. per pot and 2d. per half-pot or sieve. To ensure a proper check being kept on the empties hired out to growers, and to purchasers of the produce packed in them, a deposit of 4s. on hampers and 3s. on sieves is charged, but is returned in full when the empty is received back.

"It is the policy of the Market to eliminate the use of returnable empties as far as possible, and to this end it encourages the use of non-returnable packages, chiefly 24lb. bonnets, 6 and 12lb. chips, nets and bags. The Market keeps a sufficient stock of these on hand, and distributes them in small quantities to meet the grower's needs at practically cost price. When packages are placed full upon the Market, the cost of the package is borne partly by the grower and partly by the purchaser.

Help for the Small Grower.

"Under the arrangements made by the Market, each village has a carrier who collects the produce daily and

carts it to the Market at a small cost per package. In many cases the same man takes a supply of empties on his return journey. This is a great help to small growers. A list of the prices realised at the auction sale is also daily displayed in each village. The buying at the auction sales is carried on by several local buyers, who each represent a number of principals, and by others coming from places further afield.

“The grower’s responsibility for his produce ceases at the fall of the hammer, and the Market assumes the responsibility of payment of the exact price realised, less the charges for commission and hamper hire. Saturday is pay day, and no market is held that day. In the summer five sales per week are held, with a reduced number in winter according to requirements.

“The Market has its own hamper factory, which turns out a portion of the large quantity required, and it also has a pulping factory, for use in the event of a glut of fruit or other emergency.

“The management of the Market is entrusted to a committee of twelve shareholders, elected by the members at the annual general meeting. Each year six seats are vacated, so that there are always six old hands left on the committee, and in practice it is found that retiring committee men offering themselves for re-election are usually, but not always, elected to a further term of office. The actual detail management of the business is entrusted to a manager. It is doubtless largely owing to the fact that the committee is composed of practical growers, with a leaven of persons versed in finance and other businesses, supported by

the services of a competent, up-to-date man as manager, that the Market is so successful.

“As many as 1,500 individuals have sent produce to the sales in a single week, and the proceeds have increased every year since the first, 1920 marking £164,000.

“There is no doubt that Pershore Co-operative Fruit Market has enormously helped the district to secure its present position, and there are few growers who would willingly do without it.”

CHAPTER IV

MARKET PACKAGES

Returnable Packages—Non-Returnable Packages.

BEFORE going on to describe in detail the *modus operandi* of packing fruit under the best modern methods, it is desirable to consider the question of packages generally, and to demonstrate the superiority of the non-returnable over the returnable for National distribution purposes.

The enormous stock of empties of various returnable designs held by salesmen and growers will prohibit the immediate exclusive adoption of non-returnables, but unless a start is made at once, the present conditions will remain in force longer than is desirable. It is hoped to show, that except for perhaps purely local business, and special isolated cases, the non-returnable package has overwhelming advantages.

Returnable Packages—Advantages and Disadvantages.

The advantage of the returnable package to the grower is that when he is using salesmen's returnable packages he is trading on the salesmen's capital. In times of glut these empties are often useful.

The advantage to the salesman is that his own empties must be returned full to him direct and to him alone.

The advantage to the retailer is that the packages are very useful for the temporary storage of produce.

The case against returnable packages is as follows :—

The disadvantages to growers are (1) that they must be returned full direct to the salesman who owns them, (2) they have to be paid for in the form of extra commission on the sale value of the produce, (3) shortage of empties is often acute and most inconvenient, (4) cost of storage is considerable.

The disadvantages to the salesmen are (1) that they represent unproductive capital expenditure, and (2) constantly recurring transport expense.

The disadvantages to the retailer are (1) that they have to be paid for on receipt, thus reducing the retailer's purchasing power, (2) they cannot be sold with the produce, and have to be returned free of cost to the salesmen from whom they come.

The Case for Non-Returnable Packages.

The great advantage to the grower is that they give him a free market, that is to say, he can send his produce to any market and to any salesman he likes, thereby often enabling him to obtain higher prices when gluts occur. The grower is enabled to establish his own individual connection, to develop special avenues of distribution, and by the adoption of a trade mark to create a goodwill.

Their cost, if not charged for with the produce, would be compensated for by a reduction of the salesman's commission and increased freedom of marketing.

Much space is saved in storage, as most are capable of being "nested" (i.e., packed within each other) or stored flat. Owing to their lightness, they save freight costs. The expense of returning to the owner is eliminated.

The advantages to the salesman are that they lock up no capital and avert those expenses of booking in and out which are inseparable from the use of returnables.

The advantages to the retailer are that no deposits or capital are locked up on the purchase of produce; there is greater power of purchase and consequent increased turnover. The packages can be sold direct to the consumer with the produce or sold empty. No expense is incurred in returning them to the salesman.

The case against non-returnables is difficult to formulate, in fact, there is no tangible objection whatever.

If they are purchased before the crop matures every manufacturer gives credit, and it should not be difficult, after each season, to set aside a sum wherewith to provide packages for the next season. In reckoning the cost of non-returnables, the grower must realise that he bears all the cost of distribution, whether he uses his own empties or those of his salesman, and therefore the lower this cost is the better it is for the grower. Salesmen and retailers make their living by their service to the grower, forming the link between

grower and consumer, and this service is more or less costly according to the manner in which the grower packs and markets his produce.

As already stated, it is impossible for the general grower to consign his produce direct to the consumer, and the defects of the present system of distribution can only be removed by the adoption of every device that will reduce cost and increase speed.

CHAPTER V

PACKING APPLES IN NON-RETURNABLE BOXES

*Packing in Trays—Standard Boxes—Standard Packs
—Diagonal Packing—Determining Counts—Wrap-
ping—Graders.*

IN the present chapter we propose to describe the best and most modern methods of packing commercial Apples, and our remarks will be based on the scheme described in Chapter II.

Special Dessert Apples in Peach Boxes or Trays.

This package may be non-returnable if desired, but as Covent Garden is the only market which handles any quantity of this class of fruit, it is possible to obtain from salesmen Peach boxes (returnable) in which Apples may be packed in precisely the same way as Peaches and Nectarines.

Only the very best dessert fruit may be packed in this way, and as a rule only during the early part of a good season, but the system may be pursued during the whole of a season when Apples are scarce, always provided the fruit is absolutely first-class. What the grower may think first-class and what the market may think

first-class are, however, often different things. There is a very limited market for this class of fruit, and returns must be carefully watched, as it may be found that Apples in bushel boxes or half-sieves are making an equal sum at a much lower cost of packing.

There are two methods of packing in trays: nesting and packing in touching.

For nesting, first line the box with white tissue paper, not bringing it higher than just to cover the top edges of the sides. Next place in the bottom of the box a layer of clean hay or coarse wood wool, then a layer of white aspen wood wool, well pulled out. With the first finger of each hand make a nest and insert one Apple in it. There may be 20, 24, or 30 nests in all, according to the size of the Apples. When the box is filled, carefully tuck in all the ends of wood wool, and and see that at least half the Apple is shown. Of course the Apples must be all of the same size, and the box must present the appearance of being quite full. The fruits may be packed on their sides or on their stalks, whichever looks most attractive. A sheet of white tissue paper should be laid on the top of the fruit, with a thick layer of wood wool or clean hay over all. The lid is then put on and the boxes corded in fours. The label must bear, besides the name and address of the consignee, and the name (or the mark) of the grower, the name of the variety, and the number of fruits in each box.

When prices are not good, owing to the large quantity of similar fruit on the market or other causes, the boxes are prepared in the same way, but the Apples are placed in the box tightly, touching each other, and protected

from the sides of the box by a roll of wood wool in paper. The box is then finished off as above described.

Perfect neatness must be observed, and the packed fruit should present the appearance of an exhibit. It is usual for two or three women to prepare the boxes, one or two more grading and selecting the fruit, others packing, and finishing off and cording up and labelling. A fairly good packer should be able to pack thirty boxes per hour. As in all packing operations, organisation reduces the cost to a minimum.

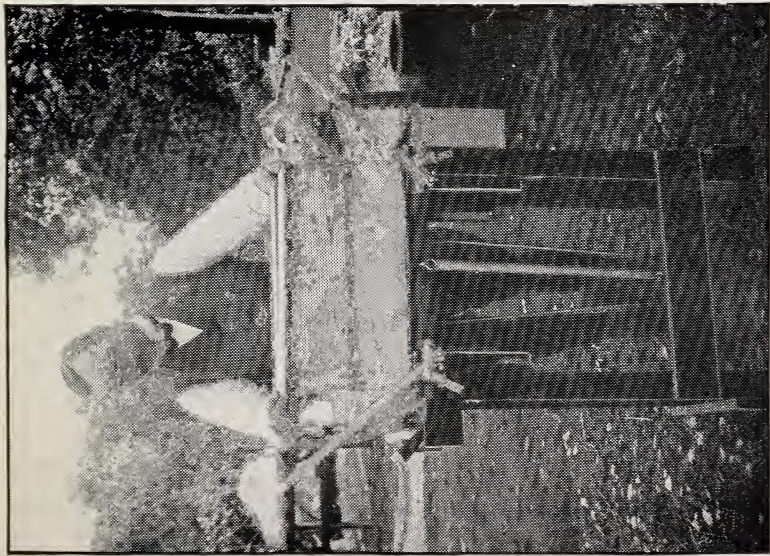
Apples in British Standard Boxes.

Packing in standard boxes is the most scientific method of all, and the Dominion* packing houses have reduced it to a fine art.

There is only one way of packing these boxes, because the system admits of no alternative whatever. All the boxes are non-returnable, and may be purchased in the flat at from 8d. to 9d. each (present prices) in large lots. They must be of new white wood, free from knots. The regulation dimensions of the parts of the box are as follows :—

2 ends	..	..	..	..	11½ by 10½ by ¾ in.
2 sides	..	..	..	..	19½ by 10½ by ⅝ ins.
2 tops and bottoms	..	..	..	..	19½ by 11 by ⅜ ins.
4 cleats	..	..	..	..	11 by ¾ by ¼ in.

* Growers who wish to study this method of packing in its smallest details are referred to Bulletin No. 2 of the Department of Agriculture, Fruit Branch, Ottawa, Canada, which also describes barrel packing. The practice in the United Kingdom, as described in the present chapter, is based on the Bulletin, and the author is indebted to this publication for some of the material of this chapter.



THE "BOXER" PRESS FOR USE IN NAILING DOWN APPLE BOXES.

FIG. 1.

The box on Press and lid being adjusted. By depressing the pedal the iron bands are caused to descend, and, firmly pressing the lid down, hold it in position for nailing.

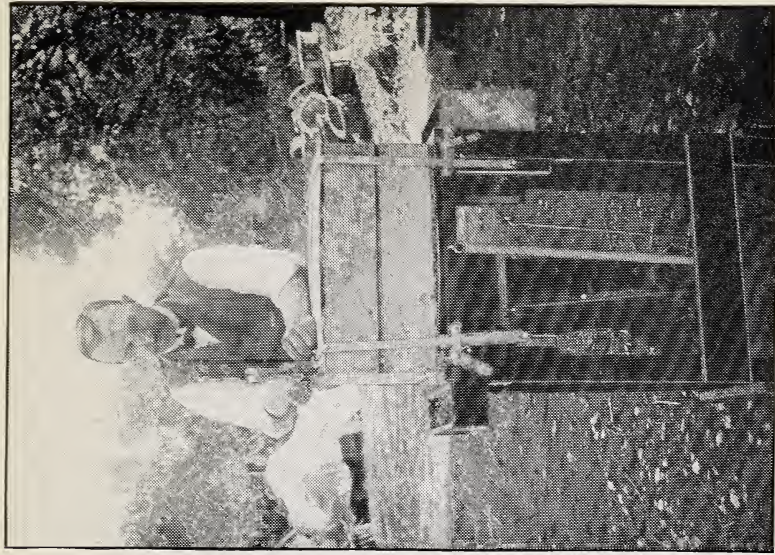


FIG. 2.

The nailing being accomplished, the pedal is released and the iron bands return to the position shown in Fig. 1, leaving the box ready for removal.



These parts make up into a box of the internal measurements 18 by 11½ by 10½ ins. The present price of British made wicker bushel sieves is about 4s., so that the price of the box compares very favourably, especially when all the other advantages of the non-returnable are taken into consideration.

Boxes are best bought in the "shook" and put together just before they are required. Much storage space is thus saved.

Cleats (thin strips of wood) are used to put across the ends of the boxes. When nailing up the box, nail through the cleat.

If the cleats tend to split, they should be soaked in water. Cleats protect the bulge somewhat, strengthen the top and bottom pieces, and prevent them splitting. When the box is made up, the bottom cleats are put on at that time, and when packed the top cleats are put on top of top piece ends.

An excellent box press called the "Boxer" is made by Messrs. Haynes, Ltd., Maidstone (see illustrations, Figs. 1 and 2). Another very useful box press is made by Messrs. Drake and Fletcher, Ltd., Maidstone, and is called the "Nailer" (see illustrations, Figs. 3 and 4). These appliances are valuable in the packing house, because they save much labour, and what is more important, prevent the ends of the lids from splitting.

Packing in Standard Boxes.

In packing, diagonal lines are formed. Each fruit is packed in the hollow made by its two neighbours.

There are five packs in general use, known as 4-3, 3-3, 3-2, 2-2 and 2-1. The 3-2 pack embraces 10 sizes, the 2-2 also 10 sizes, and the 2-1 only 5 sizes, which are for very large Apples.

For the smallest sizes (2 to $2\frac{1}{4}$ ins. diameter) the 3-3 or 4-3 pack is used, six layers to fill the box, but this size is seldom used except for such choice varieties as Cox's Orange Pippin and in scarce seasons.

The following table contains full particulars :

3-2 DIAGONAL PACK.

5 Tiers or Layers.

3-2, 4-4	..	..	..	100 Apples to the box		
3-2, 4-5	..	..	..	113	..	..
3-2, 5-5	..	..	..	125	..	..
3-2, 5-6	..	..	..	138	..	..
3-2, 6-6	..	..	..	150	..	..
3-2, 6-7	..	..	..	163	..	..
3-2, 7-7	..	..	..	175	..	..
3-2, 7-8	..	..	..	188	..	..
3-2, 8-8	..	..	..	200	..	..
3-2, 8-9	..	..	..	213	..	..

2-2 DIAGONAL PACK.

4 Tiers.

2-2, 3-3	..	..	..	48 Apples to the box.		
2-2, 3-4	..	..	..	56	..	..
2-2, 4-4	..	..	..	64	..	..
2-2, 4-5	..	..	..	72	..	..
2-2, 5-5	..	..	..	80	..	..
2-2, 5-6	..	..	..	88	..	..
2-2, 6-6	..	..	..	96	..	..
2-2, 6-7	..	..	..	104	..	..
2-2, 7-7	..	..	..	112	..	..
2-2, 7-8	..	..	..	120	..	..



THE "NAILER" APPLE BOXING PRESS.

FIG. 3.

Press ready to receive Box.

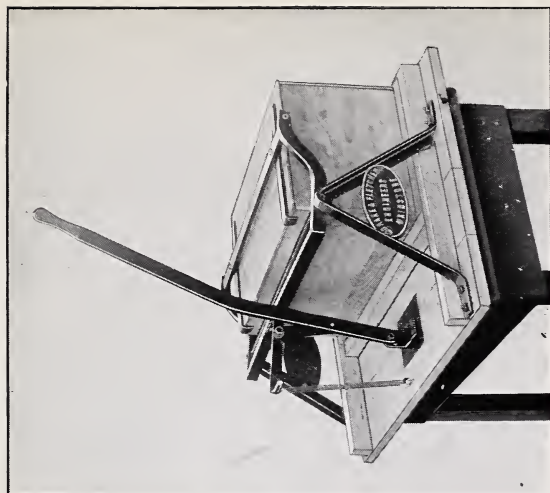


FIG. 4.

Box put on, lever pulled forward, and lid held firmly while nailing is being done.

(By courtesy of Messrs. Drake and Fletcher, Maidstone.)



2-1 DIAGONAL PACK.

3 Tiers.

2-1, 3-4	..	..	..	32 Apples to the box
2-1, 4-4	..	..	..	36 „ „
2-1, 4-5	..	..	..	41 „ „
2-1, 5-5	..	..	..	45 „ „
2-1, 5-6	..	..	..	50 „ „

3-3 DIAGONAL PACK.

6 Tiers.

3-3, 5-6	..	..	..	198 Apples to the box
3-3, 6-6	..	..	..	216 „ „
3-3, 6-7	..	..	..	234 „ „
3-3, 7-7	..	..	..	252 „ „
3-3, 7-8	..	..	..	270 „ „
3-3, 8-8	..	..	..	288 „ „
3-3, 8-9	..	..	..	306 „ „

Methods by which Packers should determine the Packs to be used.

Packers should adopt the following guide, and under no circumstances should they depart from it :—

- (1) If 5 Apples of the same size fit loosely side by side and the sixth will not go in, the pack is 3-3, 6 tiers or layers to fill the box. (Or 4-3; see page 54).
- (2) If 4 Apples of the same size fit side by side across the box, or 4 fit loosely and the fifth will not go in, the pack is 3-2, 5 layers to fill the box.
- (3) If 3 Apples of the same size fit loosely across the box side by side, and the fourth will not go in, the pack is 2-2, four layers to fill the box.
- (4) If 2 Apples of the same size fit loosely across the box side by side, and the third will not go in, the pack is 2-1, 3 layers to fill the box.

All Apples to be placed on the stalk for the foregoing rules.

The 3-2 Diagonal Pack (medium size fruit).

To commence this pack start with 3 Apples of the same size, 1 in each corner and 1 exactly half-way between. Then place in the next row 2 Apples, 1 in each of the spaces made by the first 3. Follow this up with 3 Apples and then with 2 until the first tier or layer is finished, keeping the tier firmly pressed towards the end of the box after each row is in place. This will ensure the lower tier being compact, and if the proper alignment is followed throughout, a firm pack will be secured.

Great care should be exercised to keep the rows of twos and threes straight across the box at right angles to the sides, and to have the Apples as uniform in size as possible, otherwise the alignment will be lost, causing confusion and disappointment.

To pack the second tier, commence with 2 Apples covering the spaces between the first 3 Apples of the first tier, then 3 and 2, 3 and 2, until the tier is finished, taking care that the alignment is maintained by always placing Apples over the space in the tier below.

The third tier commences with 3 Apples exactly in the same manner as the first.

The fourth tier will be started with 2 Apples the same as the second, while the fifth (and last) tier will be identical with the first and third, commencing with 3 Apples.

Figs. 5, 6 and 7 herewith show examples of the 3-2 pack. The first, with rows of 7 and 8 fruits alternately, contains 188 Apples. The second, with rows of 8, contains 200 Apples. The third, with rows of 8 and 9 alternately, contains 213 Apples.

When the beginner has thoroughly grasped the theory of the pack, greater speed can be obtained by packing diagonally after the first 2 or more rows on the first tier are placed in, as described under the heading "Packing Diagonally" further on.

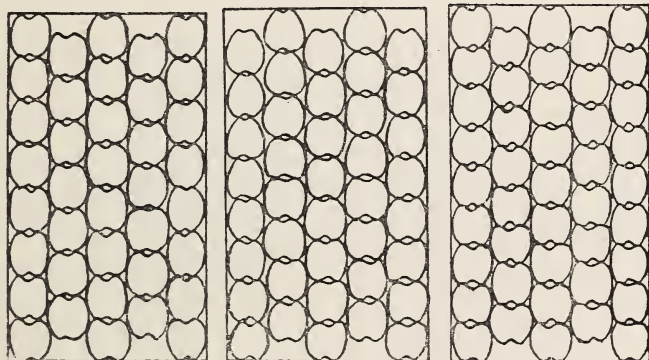


FIG. 5.—3-2, 7-8, 188 apples. FIG. 6.—3-2, 8-8, 200 apples. FIG. 7.—3-2, 8-9, 213 apples.

THREE EXAMPLES OF 3-2 PACKS FOR APPLES.

For details see text.

(By courtesy of the "Fruit-Grower.")

The 2-2 Diagonal Pack (large Apples).

Start this pack with 2 Apples, 1 in the corner of the box and the other half way between that Apple and the other corner. Next place in 2 more Apples, 1 between the 2 already in and the other between the second

Apple and the side of the box. Continue this throughout the tier, taking care to ensure proper alignment. For the second tier commence with 2 Apples, placing them over the spaces made by the first 2 of the first layer. Continue this throughout the box, noting particularly that each tier finishes over the spaces left by the last Apples of the under tier. The third tier is commenced exactly in the same manner as the first while the fourth (and last) is identical with the second.

Figs. 8, 9, 10 and 11 herewith show examples of this pack.

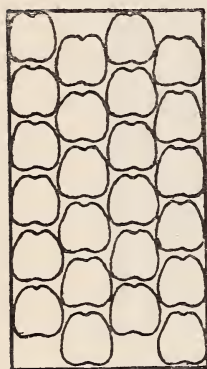


FIG. 8.—2-2, 6-6.
96 apples.

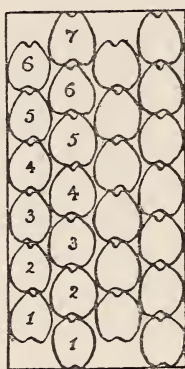


FIG. 9.—2-2, 6-7.
104 apples.

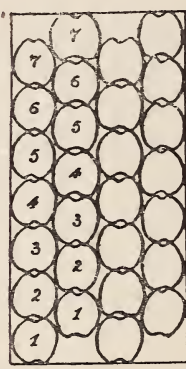


FIG. 10.—2-2, 7-7.
112 apples.

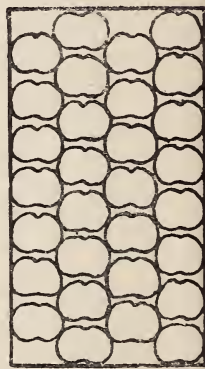


FIG. 11.—2-2, 7-8.
120 apples.

EXAMPLES OF 2-2 PACKS FOR APPLES.

For details see text.

(By courtesy of the "Fruit-Grower.")

The first, with rows of 6, contains 96 Apples. The second with rows of 6 and 7, contains 104 Apples. The third, with rows of 7, contains 112 Apples. The fourth, with rows of 7 and 8, contains 120 Apples.

The 2-1 Diagonal Pack (very large Apples).

To commence this pack, place 2 Apples, 1 in each corner of the box, on their sides, then 1 Apple between, then 2, then 1, until the tier is finished.

The second tier is commenced with 1 Apple placed over the space between the first 2 on the first tier. Follow this up with 2, then 1, until the second tier is completed. The third tier is identical with the first. It should be remembered that all Apples are on the side, keeping either the stem or eye to the packer. It is generally found in all side packs that the Apples fit better if the stems of the first Apples are kept towards the packer, and the remainder of the tier placed with the eye towards the packer. The packer must use his judgment in this respect, as Apples vary so much in shape that it is not possible to make a definite rule. After very little practice the packer will be able to decide quite readily.

The 3-3 Pack (very small fruit).

For the minimum grade allowed in the Schedule of the Federation of British Growers (2 to $2\frac{1}{4}$ ins.), a 3-3 pack is used, and is made on similar lines to the 2-2 pack. Start with the first Apple in the corner of the box, the second about $1\frac{7}{8}$ ins. away, and the third $1\frac{7}{8}$ ins. from the second. The fourth will go between the third and the side of the box, the fifth between the third and second, and the sixth between the second and first.

There is, however, serious objection to the 3-3 pack in that there is a tendency for the second row

Apples to slip between those of the first row and spoil the pack.

This has been got over by packing the 3-3 size Apples as 4-3, and such sorts as Cox's Orange Pippin, Worcester Pearmain and King of the Pippins have packed exceedingly well so.

The 4-3 pack is started in a similar way to the 3-2, 1 Apple in each corner of the box. The second row is formed by putting an Apple in each hollow left by the first row and so on.

It will be found that small Apples of about $2\frac{1}{4}$ inches diameter will generally pack 4-3, 6-5; six tiers, alternately 39 and 38 Apples to each tier, 231 Apples to the box. Naturally different size Apples will vary a little from the pack mentioned such as 4-3, 6-6: or 4-3, 6-7, but every 4-3 pack will pack 6 tiers in the case of this size Apple.

How to Determine Counts.

In order to ascertain the number of Apples in a box the packer or buyer first notes the pack, whether 2-1, 2-2, 3-2, 3-3 or 4-3. He then counts the Apples lengthwise in the box, and by referring to the table of packs the actual number in the box is immediately ascertained. A study of the illustrations will make this clear. Particular attention is directed to Figs. 7, 9 and 10. It will be seen that Fig. 9 shows a 2-2 pack and is described as a 2-2, 6-7. This means that in the width of the box the pack is 2-2, while in the length it is 6-7. Fig. 10 shows a 2-2 pack with 7-7 fruits in the length. In these two figures the Apples have been numbered to illustrate the point, which applies equally to all the

packs. After very little practice the packer will be able to read his count at a glance.

The beginner is advised to place his Apples in the box at right angles to the sides until the pack is completed. The object of this is to secure proper alignment, which is absolutely essential. Attention to speed may come later. The packer can attain greater speed by packing diagonally, but he should not attempt it until he has thoroughly grasped the theory and learned to maintain alignment.

Packing Diagonally.

In considering the method of packing diagonally, the 3-2 pack has been selected for purposes of illustration, but the same idea applies to the other packs. The first 3 Apples, numbered 1, 3, 2, are placed in

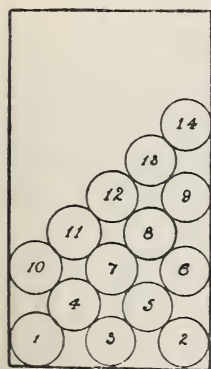


FIG. 12.

PACKING APPLES
DIAGONALLY.

For details see text.
(By courtesy of the
"Fruit-Grower.")

position as illustrated in Fig. 12, and are followed by the 2 Apples numbered 4 and 5. The pack thus started proceeds with Apples 6 and 7, care being taken that the first 5 Apples are not moved from their original positions. Next come 8 and 9, after which the pack can be completed by packing 10, 11, 12, 13 and 14 diagonally, and so on until the layer is finished.

It will be noted that in the 3-2 pack 5 Apples are required to complete 1 diagonal row. These should just fit. If they are loose

it is because either Apples too small or Apples of varying sizes have been used. On the other hand, if there is a difficulty in getting the 5 Apples in position diagonally, it is because one is too large. It is useless to endeavour to correct this in any other manner than by substituting specimens of the proper size. Practice is necessary to overcome such difficulties entirely, and the beginner should not be discouraged by little delays of the kind indicated. As soon as he becomes familiar with the various sizes of Apples, and the packs to which each size is most suitable, he will be surprised at the facility which he will acquire. The difficulties are very slight, and soon disappear.

In Fig. 13 are shown several boxes from which the covers have been removed. These illustrate the construction of several different packs. The 3 top boxes give an excellent impression of the bulge in each box. In Fig. 14, where some of the same packages shown in Fig. 13 are shown with the sides as well as the tops removed, the alignment is clearly demonstrated, and the packs can be read. The right-hand box, for example, shows from the face that the pack is 3-2, 5-6, while the side shows the same reading. The principle applies equally to all standard-box Apple packs, and the beginner would be amply rewarded by examining some of his packs in this manner in order to ascertain that the alignment is correct through the entire package.

Wrapping the Fruit.

All Apples packed in boxes in the way advised should be wrapped. Wrapping is by no means a

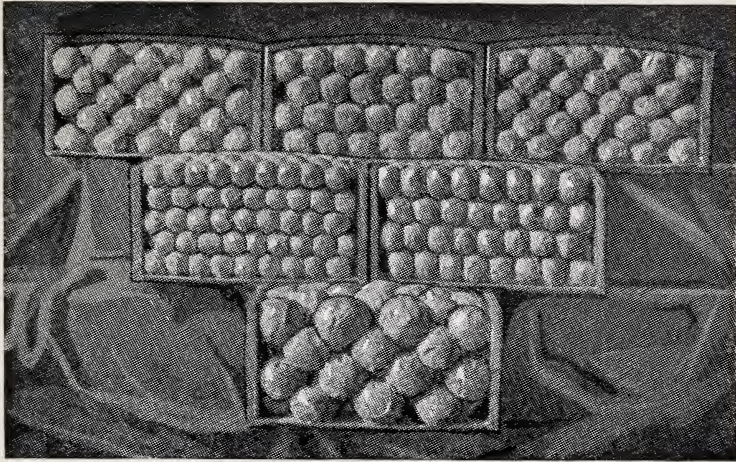


FIG. 13.—PACKING APPLES IN NON-RETURNABLE BOXES.
 Showing the construction of the pack and the bulge.
(By courtesy of the "Fruit-Grower.")

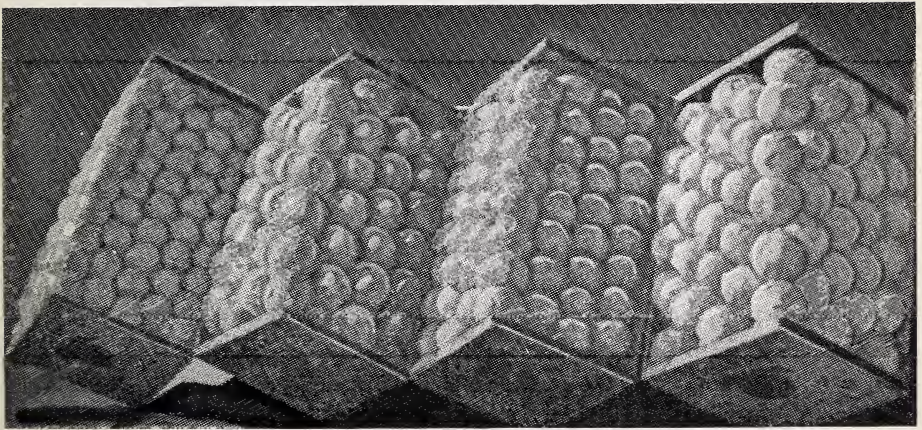


FIG. 14.—PACKING APPLES IN NON-RETURNABLE BOXES.
 Reading the packing from both side and face; for details see text.
(By courtesy of the "Fruit-Grower.")

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difficult operation, in fact, experienced packers can without question pack faster when wrapping the fruit.

Wrapping has several advantages :—

- (1) The wrap serves as a cushion, minimising the risk of bruising.
- (2) It prevents rot and fungus diseases spreading from specimen to specimen.
- (3) It maintains a more even temperature in the fruit.
- (4) It gives a more finished appearance to the package when exposed for sale.
- (5) It preserves freshness in appearance, and adds to the keeping qualities.
- (6) The paper absorbs surplus moisture.
- (7) It facilitates rapid packing.

Wrapping should be performed with as few movements as possible. The paper should be placed conveniently, smooth side up, and a rubber finger-stall worn on the middle finger of the left hand. At the start the paper is held in the left hand and the fruit in the right. The Apple is then dropped or thrown into the paper on its side. It is then wrapped with as few movements as possible and placed in the box with the left hand.

It should be remembered that every movement will be repeated thousands of times during the day, so that superfluous movements tire the packer unnecessarily ; they also interfere with the speed. It is scarcely possible to illustrate the motions on paper, but if the packer practises the various movements intelligently

he will soon make a good wrap with the fewest possible movements. Neatness of wrap cannot be acquired immediately, but only after considerable practice. During the whole process of wrapping the Apple remains in the left hand until it is placed in the box, the right hand then reaching for another Apple.

Wrapped fruit is illustrated in Fig. 13.

The sizes of wrapping paper in common use are :—

10 by 12 inches for very large Apples.

10 by 10 inches for counts 56 to 96.

8 by 9 and 8 by 10 for counts 138 to 175.

8 by 8 for smaller Apples.

Wrapping paper offers splendid material for advertising the business of the grower or of the selling association.

With the introduction of diagonal packs, layer paper is rendered unnecessary, inasmuch as the Apples on each tier do not sit directly on the top of Apples on the under tier, but in the spaces between them. A device has very recently been brought into use which saves a great deal of the labour of separate wrapping. It consists of layers of paper with slits cut in, into which the Apples are placed. Then as the Apples are pressed into position, they are wrapped automatically by the slits allowing the paper to encircle the fruit. A differently prepared layer paper is used for every different pack, as the slits must be cut according to the number of Apples in each layer. Until this type of layer paper is introduced into the United Kingdom we must wrap each Apple separately as before described.

The Bulge and Height of the Pack.

The height at the ends of the finished box should be $\frac{1}{4}$ to $\frac{3}{8}$ -inch above the edge of the box, with a bulge of from 1 to $1\frac{1}{2}$ inches in the middle (see Fig. 13). This gives an even pressure on the fruit when the cover is nailed on, and a bulge of $\frac{1}{2}$ to $\frac{3}{4}$ -inch top and bottom. The cover should be made of strong, thin, elastic wood about $\frac{3}{16}$ -inch thick, which will hold the pack rigid even after the natural shrinkage of the fruit during storage or transit. The bulge or crown is obtained by selecting very slightly larger Apples for placing in the centre of the pack. There is a slight variation of size in the grades, just sufficient to allow for the creation of the bulge. If the Apples are graded to quarter inches there will be sufficient variation for this purpose.

Storage and Transport of Packed Boxes.

Packed boxes must always be stacked and loaded for transit on their sides. This is vitally important.

Selling by Count.

It will be found in practice best to sell all boxed Apples by count instead of by weight. Distributors are accustomed to handling overseas boxed Apples by count, and every box packed on the lines herein described will be a standard count according to the pack used. Moreover, the count indicates the size readily and accurately.

Graders.

The American packing houses have reduced the art of grading mechanically to a very fine one, and the machines in use are very elaborate and costly and mostly grade by weight.

A machine much in use in the United Kingdom is the Fletcher-Becker (see illustration herewith, Fig. 15) which grades by size, the Apples being passed over rubber conveyor bands, in which are cut holes of the required sizes.

Most of the Canadian packers grade by eye, and this becomes easy with practice. Some British growers use a table with holes. The Apples are passed through and then roll down felt-lined troughs into felt-lined trays. The edges of the holes are made of linoleum in order to prevent bruising. The main disadvantage of this simple grading table is that the person grading is liable to put the fruit into a larger hole than it should go through. The method is slow, but is better than nothing. It is hoped that a grading machine will be devised which will come within the means of every grower, and yet do its work effectively. The present means of grading by size is not accurate enough, and the packer must again grade by eye to ensure a perfect pack. This comes easy with practice and every inducement must be offered to ensure efficiency.

Final Hints to Beginners.

- (1) Learn to size your fruit accurately, then placing in the box is a simple matter.

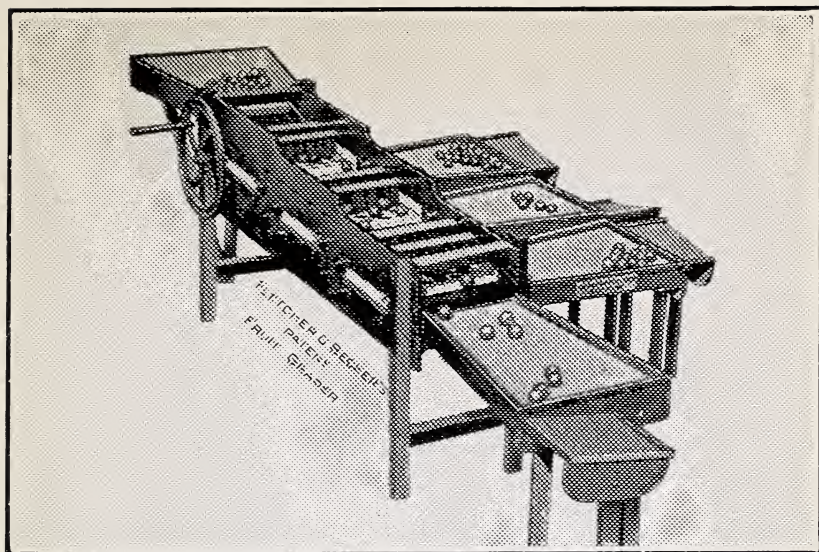


FIG. 15.—THE FLETCHER-BECKER FRUIT GRADER.
For details see text.

(By courtesy of Messrs. Drake and Fletcher, Maidstone.)



FIG. 16.—THE BONNET.

An improved light half-bushel Fruit Basket, with flat bottom and strong wooden cover.

When empty the baskets "nest" inside each other, thus economising space and carriage.

(By courtesy of the British Basket Company, Crownpoint Works, Glasgow.)



- (2) Place all Apples in the box in the same relative position. It cannot be impressed too strongly upon beginners that all sizes and shapes of Apples can be properly and conveniently packed in the British Standard Apple box.
- (3) Successful packing can only be done with Apples of a uniform size in each box. It will not do to use an Apple larger than the size being packed, and then attempt to straighten the row by using a small Apple next to it.
- (4) Cleanliness cannot be too strongly insisted upon in every feature of box packing. Finger marks on boxes, or careless rubbing in of moisture and dust, are too common. Scrupulous attention should be given to the fruit, and all specimens that are not absolutely free from contamination of any sort should be rejected.
- (5) Should there be any dust or spray material upon the Apples when picked, it is easy to take it off at that time. If the Apples are allowed to stand they acquire a certain gumminess that renders it difficult to make them look clean.
- (6) Box packing is the repetition of the same motions many thousands of times a day. If, therefore, even one unnecessary motion is made with each specimen, it becomes a serious handicap in a day's work.
- (7) Packers should keep their finger nails well trimmed, otherwise the fruit may be punctured and decay. In the Western States packers are required to wear white canvas gloves.

- (8) Fruit should be uniform in colour as well as in size.
- (9) All Apples in boxes should be packed with all their eyes to one end of the box and all their stalks to the other end. The old "offset" pack, stalk to cheek, should not be used, and is never necessary when the foregoing instructions are carried out. The serious damage caused by the stalk piercing the cheek of the next Apple is sufficient to ruin the whole box. If the Apples are packed in hollows formed by the layer underneath, as they should be, the stalks will touch nothing, but will come between two Apples.

Practical Demonstrations in Packing.

The Federation of British Growers will advise where to apply for advice and practical demonstrations in packing fruit. It is desirable that growers should combine in applying for instruction, so that the demonstrations may be made to as many growers as possible at one time. Applications should be made to the Secretary of the Federation, 18, Bedford Square, London, W.C.1.

CHAPTER VI

OTHER METHODS OF PACKING APPLES.

Bonnets—Half-Sieves—Sieves—Barrels.

THE older methods of packing Apples must not be considered obsolete or negligible, as in some circumstances they have considerable importance.

Apples in Bonnets, Half-Sieves and Sieves.

The bonnet (see illustration, Fig. 16) is a non-returnable chip basket in the shape of a half-sieve, except that it is larger in circumference at the top than at the bottom, so that a number may be nested when empty.

It is rather light, but is suitable for comparatively short journeys. It is fitted with a sufficiently stout wooden lid, which is wired in by means of wire clasps. It is suitable for dessert sorts.

The half-bushel sieve is a returnable wicker basket about 15 ins. in diameter, 8 ins. deep at the side, and 7 ins. deep in the middle, with a stout wicker rim. Like the bonnet, it is suitable for dessert sorts. It has no lid.

The bushel sieve is of the same pattern as the half-sieve, but of twice the capacity. It is about 17 ins. in

diameter, $10\frac{1}{2}$ ins. deep at the side, and 9 ins. deep in the middle. It is suitable for cooking varieties.

These packages are grouped together, because the principle of packing Apples is substantially the same in all of them.

First put a thin layer of wood wool or clean hay on the bottom of the package, and then line the sides with three or four thicknesses of tissue paper, or several thicknesses of newspaper or—best of all—that thick soft paper known as “butcher blue,” a kind of sugar paper which can be obtained of horticultural sundriesmen. The wicker is liable to bruise the fruit badly, hence the need for protection. After the Apples have been graded to size, proceed to pack them in rings. Place the second layer in the hollows formed by the first.

A little experience is necessary in order to get the baskets full yet level, but when several baskets have been packed of each size the packer knows how to proceed. There should be a “crown” of about an inch in the centre, that is to say, the Apples should be a little higher in the centre than at the side. It is essential that the baskets be packed quite tightly, as any loosely packed fruit will arrive on the market “slack,” and being sold as such, may lower the value of the whole consignment. Far more bruising results from too loose than from too tight packing; indeed, it is almost impossible to pack too tightly. Experience will teach whether it is best to pack a particular Apple on its side or on its stalk; as a rule the former makes the more attractive pack. Some quite good packers do not pack every Apple in rings, but after the first layer

has been closely packed the rest are laid in, and the basket "racked" or shaken well on a solid floor or bench; the top layer is then put in and pressed level.

This method is not so good as "ringing," and although the latter may take a little longer it pays in the end. It is advisable to teach the packer to take a pride in his work, and careful supervision is essential. A great many packers will, with the intention of doing their best for their employers, "top" their baskets, but this must be rigorously forbidden. Large growers seldom devote enough attention to their packing departments. The foreman must first receive a thorough training, and he must then see that the packers carry out instructions in every particular. It is far better that packing should cost too much at first than that slovenly ways should be allowed. Celerity will come with practice, and it will be found that good packing can be done quite as quickly as bad.

After the packages have been packed as described, lay on a sheet or two of perfectly clean paper. Then lay on some wood wool or clean hay, and in the cases of the half-sieve and sieve, fasten flat split pointed hazel wands into the rims. These wands are a great protection to the fruit, and bear a great deal of the weight if one basket is placed on top of another. Sometimes the baskets are simply fastened over with string, but in this case the only protection provided is that of the wood wool or hay, and it is not sufficient.

Many growers print their mark, or the consignee's name, on the covering paper, in which case an extra piece of paper must be put on over the hay.

In the case of the bonnet, the wooden lid is fastened on, taking the place of wands or string, and this lid gives the best protection of all.

Some growers use hay to counteract the ill effects of loose packing, but the hay spoils the appearance of the sample and the value is reduced in consequence. (See illustration, Fig. 17).

As most varieties of Apples vary in weight in relation to bulk, it is necessary to put on the label the net weight or the minimum net weight. Baskets also vary in size, and if the buyer sees one small basket, and the weights are not stated, he may calculate the weight of the whole consignment on the basis of the small basket.

Apples in Barrels and Half-Barrels.

These packages are mostly used for large contracts, and the barrel as at present in use has little to recommend it, being very heavy; it holds three bushels. The half-barrel or Grape barrel is a better package, holding $1\frac{1}{2}$ bushels.

Neither of these packages is generally used new. They are receptacles which have been imported from foreign packers. When used as returnables they are undesirable. Moreover, the London markets do not like them, and they are almost exclusively used for northern markets.

If they were new, of the same pattern as those used by the Dominion packers, and used in the same way, nothing could be said against them, but then the initial cost would prevent their being used as non-returnables to any great extent. It is convenient for



FIG. 17.—PACKING APPLES IN BUSHEL SIEVES. Hay has been used to counteract the effects of loose packing, and the appearance of the fruit is spoiled.



FIG. 18.—PACKING APPLES IN BARRELS. Bad work; the fruit has been tumbled in loosely, without proper grading and packing; see also Figs. 19 and 20.

(The illustrations on this page are reproduced by permission of the Ministry of Agriculture and Fisheries.)

growers who cart their produce straight into the markets to bring back empty, once-used barrels, but if the cost of storage was well reckoned out they would not prove to be economical.

If the use of barrels develops to a greater extent than at present, manufacturers will doubtless turn their attention to making them on a large scale, in which case the cost should be much reduced; they might then come into use as non-returnables.

The method of packing is similar to that for sieves, the first few layers being placed in, then the Apples carefully laid in, and the barrel well "racked" when half full—that is, sharply rocked from side to side on a solid floor. The shaking must not be done so roughly as to displace the fruit, but only vigorously enough to settle it down tightly. The racking is done several times during the filling.

The top layers are packed in tightly, and fastened over with cord after being covered with paper and wood wool or clean hay. Sometimes a wooden or wicker lid is used, and this is preferable to cord.

Loose packing (see Fig. 18) is bad, as the fruit is bound to bruise. Fig. 19 shows better work, but the fruit is too loose and will bruise in transit. The style of work seen in Fig. 20 is excellent, as the fruit is well graded, is tight, shows the cheek, and is well set off by white paper.

Packing Apples in barrels on the Canadian system is very sound practice, but the barrels are specially made for the purpose, and the method of packing is as scientific as that of box packing. It is probably hardly necessary to adopt the Canadian method of

barrel packing in the United Kingdom, considering the comparatively short journeys which our fruit has to make. For export work the box is much to be preferred.

Figs. 17, 18, 19 and 20 are reproduced by permission of the Ministry of Agriculture and Fisheries. They appeared in the Ministry's Journal of January, 1920.

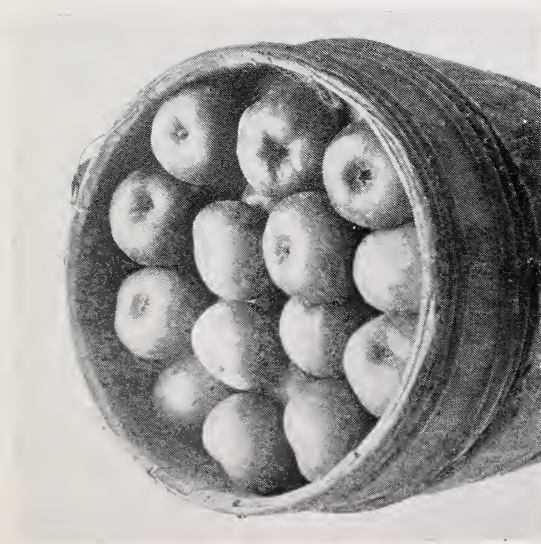


FIG. 19.—PACKING APPLES IN BARRELS.
Fair work, but the fruit is too loose and is likely to bruise in transit.*



FIG. 20.—PACKING APPLES IN BARRELS.
Good work; the fruit has been well graded, is packed tightly, shows its cheek, and is well set off with paper.

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CHAPTER VII

PACKING OTHER KINDS OF FRUIT

*Pears—Plums—Cherries—Peaches and Nectarines—
Currants—Gooseberries—Raspberries—Strawberries
—Nuts—Tomatoes.*

PEARS are packed in substantially similar ways to Apples. Peach boxes or trays are used for the very best dessert varieties. The fruit should be nearly ripe, that is, in such a condition that it will become quite ripe in about a week. Pears packed in larger packages must be quite hard. Round Pears are packed exactly like Apples, but oblong sorts are "dovetailed" when packed in the British Standard box, or when ringed in half-sieves—that is to say, the fruits are laid alternately eye end and stalk end towards the side or end of the package.

Plums and Gages.

These may be divided into two classes: (1) special ripe dessert fruit, and (2) ordinary commercial fruit. The former should include grades above the ordinary, extra large samples and extra choice varieties of Gages. Here again, as in the case of dessert apples, judgment must be exercised as to when it is profitable to use special packages; in seasons of abundance it will be

found more profitable to use the larger packages. The fruit must be perfect, evenly graded, and not over ripe.

The chip basket is the best for non-returnable packages. Sizes of 375 cubic ins., containing 6 lbs.; and 675 cubic ins., containing 12 lbs., are convenient. In packing soft and ripe fruit 12 lbs. chips should be fitted with a piece of wood to keep the middle of the chip from contracting when lifted. These pieces of wood are supplied by the manufacturers. The best cover is a wooden one that will not drop in and damage the fruit.

Chip baskets, with and without covers, are illustrated in Figs 21 and 22.

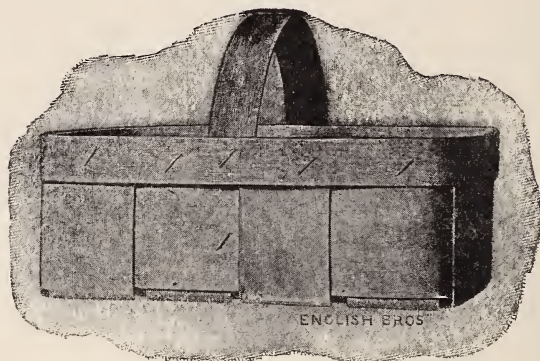


FIG. 22.—A SMALL CHIP BASKET SUITABLE
FOR SOFT FRUITS.

*(By courtesy of Messrs. English Bros.,
Wisbech.)*

The half-bonnet is similar to the bonnet, but contains half the quantity, namely 12lbs. Chips are rather light for long journeys and in such circumstances the half-bonnet is preferable. As the chip baskets and half-bonnets are clean and new they are not lined with paper

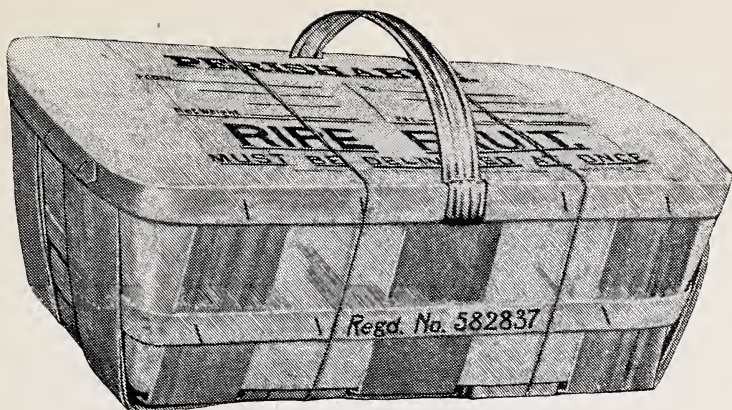


FIG. 21.—A CHIP BASKET WITH WOODEN COVER.
This is capable of holding 12 lbs. of fruit.

(By courtesy of the British Basket Co., Ltd., Crownpoint Works, Glasgow.)

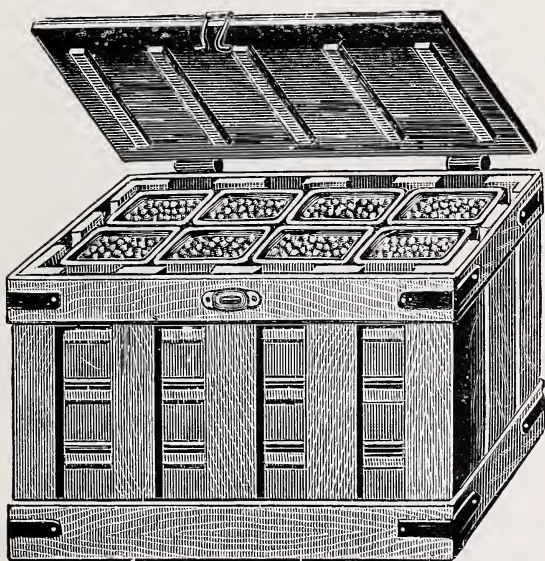


FIG. 23.—A RETURNABLE MARKET CRATE.
Suitable for holding 24, 32, or 48 -1lb. punnets
of Strawberries.

*(By courtesy of the British Basket Co., Ltd.,
Crownpoint Works, Glasgow.)*

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as a rule. The fruit is carefully placed in, the top layer made level, and the wooden lid tied on. Bonnets and half-sieves are also used for Plums and Gages, but in these packages they should be firm and dry.

All these packages must be marked with the net weight or minimum net weight, in addition to the consignee's address and the sender's name or mark.

Cherries.

Special qualities and early fruit are sometimes packed in 1-lb. chip punnets of 70 cubic ins. like Strawberries. The punnets are packed in Peach boxes, 5 in each box, or in crates. Each punnet is lined with leaves and tied over with the tissue paper.

But the bulk of the Cherries are packed into half-sieves. Soft fleshed sorts are often packed in pecks. In every case the fruit should be firm and not over ripe. Particular care must be taken that no cracked or damaged fruit is put in, or the whole package will be described as "wet," and a very low price given.

Peaches and Nectarines.

These are packed in a very similar way to choice Apples in Peach boxes. But all are nested, and finer and softer packing materials are used, the finest soft white aspen wood wool or cotton wool and good tissue paper being used throughout the box. Each fruit is often half wrapped in tissue paper, exposing the top half. Greater care is necessary in handling than for

Apples, and the fruit should be firm—in fact, three or four days in advance of full ripeness. Each box should present the appearance of being quite full of perfect fruit. Peaches and Nectarines are always packed upright. Special care must be exercised that the lids do not press heavily upon the fruits. The pressure should be just sufficient to keep the fruits in their place and no more. Some salesmen supply boxes fitted with felt pockets in which to pack each fruit, and this practically ensures safe transit.

Currants and Gooseberries.

The finest red and white Currants and Gooseberries, for special purposes, are sometimes packed in 1-lb. punnets as already described for Cherries. They are also, together with black Currants, marketed in two sizes of chip baskets, containing 6 and 12 lbs. respectively. The smaller package is used for soft-fleshed Currants, such as Boskoop Giant and Victoria. But these sorts, when three-parts ripe, together with firmer-fleshed and tougher-skinned Currants, such as French Black and Seabrook's Black, when fully ripe; also red Currants and Gooseberries while still quite firm, are more generally packed in bonnets or half-sieves. In fact the bulk of these fruits is so marketed with perfectly satisfactory results. The half-sieves are lined with clean tissue paper and fastened over as described under Apples. All these small fruits are sold by net weight.

Leaves must be kept out of the baskets and only sound fruit packed therein.

Raspberries.

Special dessert fruit is packed in 1-lb. punnets, also, if dry and in good condition, in 2-lb. (137 cubic inches), and 3-lb. (195 cubic inches) chip baskets. The 4-lb. chip package is generally too large for a journey of any length. Larger bulks, for consignment to jam factories, are put into tubs.

Loganberries are generally packed in 4-lb. and 6-lb. chips.

Strawberries.

Fruit grown under glass, and specially early and fine out-door fruit, is packed in 1-lb. punnets, lined with leaves and tied over with tissue paper. The punnets are placed in Peach boxes or crates (see Fig. 23). If in Peach boxes, 4 boxes are corded together as described for Apples put into these boxes.

The fruits should be carefully laid in, so that the stalks do not press into each other, and a couple of leaves should be placed on the top of the punnet before tying over.

Single layer boxes are also used in some districts.

The main crop is marketed in 3-lb. (195 cubic inches) and 4-lb. (260 cubic inches) chip baskets, and each basket should contain the full weight.

Probably there is more deception, or attempted deception, in regard to the weight of Strawberries than occurs with any other fruit. The nominal size of the chip basket infers that it contains a given weight, but unfortunately chip baskets are often undersized, and every grower should firmly insist on the full cubic

capacity before buying. It is a fond delusion of many growers that it is only necessary to buy and fill a "4-lb. chip" in order to give 4 lbs. of fruit. The buyer suffers from no delusions. He can "spot" a small basket at once, and when he does so the whole consignment is apt to suffer,—indeed, the whole market suffers, and the loss to the growing community is incalculable. It is true that some evaporation takes place. It is also true that some varieties weigh lighter than others. As to the latter point, the grower who elects to cultivate a light-weighting variety should use a slightly larger chip to ensure that the full weight is supplied. It is as certain as that night follows day that unless the practice of using light-weight chips for Strawberries is not stopped legislation will intervene.

The majority of growers are innocent, but unfortunately all suffer through the action of the guilty few.

In some counties, Kent particularly, Strawberries are largely marketed in returnable pecks of 10 or 12 lbs., and if these packages are used the net weight or minimum net weight should be stated on each basket.

It is important that only sound fruit be marketed; all damaged and bird-pecked fruit should be rigorously excluded.

Cob Nuts and Filberts.

These are packed in half-sieves. It is a common practice in Kent to tie two together, mouth to mouth. The bonnet is an ideal non-returnable package for Nuts, and should be much more generally used. All are sold by weight.

Tomatoes.

Although the Tomato is a fruit in the botanical sense it is not so in the sense generally accepted ; however, Tomatoes are such an important, universally grown and popular market crop that it may not be out of place to describe the method of packing and marketing, especially as a high standard has been reached by the best packers, which should be copied by all growers. The origin of the present highly developed system of grading and packing may be traced to a few large growers, who, by the adoption of exact grades, gradually influenced the whole Tomato industry. The system is somewhat similar to that already described as having been adopted by the Federation of British Growers for the better class of hardy fruit grown in this country.

One feature of the system is that the different grades are denoted by coloured paper, instead of by such invidious descriptions as Firsts, Seconds and Thirds ; or Selected, Special, Fancy, and Choice. Thus it is only necessary to mention a colour, which does not necessarily indicate that any other particular grade is inferior, but that it is of a smaller or a larger size. Different sizes are required for particular classes of trade.

The following are the grades :—

Perfect Shape and Quality.—

5-7	to the lb.	Pink Packing Paper.
8-12	„ „	Pink and White Paper.
13-16	„ „	White Paper.
11-13	„ „	Pink and White Cross.

Large or Imperfectly shaped Fruit.—All sizes except very small or chats. Blue Paper.

Small or Chats.—Blue and White Paper.

Packages.—Chip. Non-returnable box (14 ins. by 9 ins. by $5\frac{1}{2}$ ins. inside). Half Bonnets. Pecks. Strikes. Half Sieves.

Net Weight or Minimum Net Weight.

CHAPTER VIII

Supplementary Chapter by Walter P. Wright.

FIRST-CLASS HARDY FRUIT FOR MARKET.

The Future of Apple-Growing—Commercial Apples—Differences in Pruning Apples—The Effects of Grass—Feeding for Heavy Crops of Fine Fruit—Injurious Insects and Fungi—Adjuncts to Fruit—Gluts of Fruit—Retarding Market Apples by Cold Storage—First-Class Fruit Indispensable.

IN the following chapter brief consideration is given to the prospects of successful commercial Apple-cultivation in Great Britain, and to those conditions which have the chief influence on the production of fruit of high quality. It is hoped that growers will give due consideration to the points raised.

The Future of Apple-Growing.

The question is often put : “ Has not the time come when Apple-planting in the United Kingdom is being overdone ? ” The questioner points to the enormous plantings of the past twenty years. He points also to the increased importations. Our people, he suggests, cannot absorb the proceeds of these movements and more besides.

The reply is fourfold :

(1) The same question has been asked ever since the fruit-growing movement began, and time has always answered negatively.

(2) The population of our Islands is growing in numbers.

(3) The taste for fruit is increasing in an even more rapid ratio than the population.

(4) There is a growing demand abroad for high-class British fruit, thus opening up possibilities of an export trade for suitable varieties. This demand is very small at present and is limited to a few varieties ; nevertheless it is worth mentioning.

Here are four clear points, all reassuring and encouraging. There are areas in the United Kingdom in which soil and climate are admirably adapted to commercial Apple-growing. More is being made of them to-day than was the case even twenty years ago, but their possibilities are not yet fully exploited. It is towards these areas that the eyes of the planter should turn, and he should avoid sinking capital in districts where the natural conditions are unfavourable.

Commercial Apples.

The different varieties of Apples have their own traits. One sort may have a predilection for a particular district, and fail to thrive in others. If that district is not generally favourable to Apple-growing, the variety in question becomes of great local importance, while remaining nationally unimportant. There are, on the other hand, a certain number of varieties which are sufficiently catholic in their tastes to succeed in most

of the recognised fruit districts, and it is from this class, and not from the former, that the final choice for National use must be made. The further sifting out of the wheat from the chaff turns on such merits as vigour of constitution, beauty of appearance, flavour, keeping and travelling qualities, and productiveness.

In view of the enormous number of varieties in existence, it might be supposed that a great many Apples would answer an all-round test, but in point of fact few do so. This, however, is not as unfortunate as it seems, for unquestionably one of the salient matters in the systematic growing, packing and marketing of large bulks of Apples is concentration on a limited number of varieties. The amateur grower who has in view a long succession of fruit may cultivate cordons and grow a large number of sorts, but the market grower, who has to cater for a huge demand for a few popular varieties, must restrict the number severely, otherwise he will never find accommodation for a sufficient quantity of those which really matter.

The cooking Apples that count commercially to-day are Early Victoria, Lord Derby, Lane's Prince Albert, Bramley's Seedling and Newton Wonder, with Lord Suffield, Lord Grosvenor, Ecklinville Seedling, Stirling Castle, Grenadier, Royal Jubilee and Annie Elizabeth in support. The dessert varieties that count are Gladstone, Beauty of Bath, Worcester Pearmain, Allington Pippin, King of Pippins, James Grieve, Blenheim Orange, and Cox's Orange Pippin, with Duchess's Favourite, Lady Sudeley, Miller's Seedling, Rival, and Charles Ross following. Very few outside these count for much.

Differences in Apple Pruning.

Even within the confines of such comparatively short lists as the above there is room for differences that the grower and packer must take cognisance of—differences in hardiness, in habit, in vigour, in soil-likings, in size, in shape, and so forth.

Pruning alone constitutes an important study. Inasmuch as the specific object of the present work is to show the most modern methods of grading, packing and marketing, it would be irrelevant to enlarge on cultural details, nevertheless, as so much turns on getting first-class fruit, it is permissible to point out to the grower the importance of studying the peculiarities of his varieties.

He will find in Bramley's Seedling an Apple ill-suited by persistent pruning—a variety, in short, which should never be hard pruned after it has passed the nursery stage, otherwise it will be filled with gross unripe wood, and will be even slower in coming into full bearing than under semi-natural conditions, and that is bad enough, particularly when the variety is grown as an orchard standard on the Crab stock. In common with every other variety of cultivated Apple, Bramley's Seedling must be shortened once or twice while in the infant stage, but regular shortening after the head is once formed is bad practice, because it has the defect of deferring a fruiting stage which is already slower of arrival than that of most other leading sorts.

Newton Wonder thrives under very different treatment. A strong grower, it nevertheless does not form an open, spreading head without pruning (after the

early head-formation stage) to anything like the same degree as Bramley's Seedling, on the contrary, it benefits by the annual shortening of the leaders, while Bramley's does best when the leaders are left alone. Here is a fundamental difference, which the grower would be wise to give attention to. The open head is of course important in the case of Newton Wonder, and like almost every other prominent commercial cooking Apple, a dozen or so of main branches, widely disposed, suffice; nevertheless, the leaders may in most cases be shortened by about one-third every year with advantage to the tree. This prevents that extension of long, bare shoots devoid of fruit buds which is so often observed, and which means waste of space.

The invaluable Lane's Prince Albert—invaluable because it produces a large, handsome, long-keeping fruit while still comparatively young—lacks something of the naturally open, spreading head of Bramley's, and only with careful shortening and shaping in the early stages will it assume that desirable habit. When well established it forms fruit-spurs quickly and freely, so that no systematic shortening of the leaders is required in order to avoid wasted shoots; indeed, that practice is likely to cause waste in another way—namely, by delaying the formation of fruiting spurs.

Then we have Lord Derby, an exceedingly useful early to medium culinary variety, bearing freely on the young tree, and producing large fruit. In common with most other strong growers, it readily forms a large, open, spreading head when shortened once or twice in the nursery; but, differing from some of them,

it forms fruit spurs quickly and abundantly without further treatment, and does not generally benefit by annual shortening. In other words, it is suited rather by the Lane's than by the Newton pruning.

Early Victoria also approximates rather to the Lane's than the Newton class—that is to say, it forms a good head under nursery shortening, and then proceeds to furnish the main branches well with fruiting spurs without severe annual shortening.

With respect to the dessert varieties, all benefit by being shortened during the nursery stage, and most of them: e.g., Cox's Orange Pippin, Allington Pippin, James Grieve, Worcester Pearmain and Beauty of Bath, by further shortening to get an open head while young. Blenheim Orange, like Bramley's, forms it naturally, but matures its fruit spurs slowly. One or two, however, and notably Rival and Gladstone, are best left alone after the head has once been formed. But even those varieties which need some amount of early pruning in order to force the formation of an open head are not benefited by severe annual shortening, in fact, such hard pruning may prejudice fruit-production. The valuable early varieties, Worcester Pearmain and Allington, are cases in point. On the other hand, some varieties rather benefit by it.

Space will not permit of this interesting subject being pursued farther in the present work, but it is eminently worthy of the attention of growers. Those who cultivate a limited number of varieties can well afford to study the peculiarities of each, indeed, it is essential that they should do so if the best results are to be obtained, particularly as the foregoing remarks,

while generally sound, may not apply equally on all sorts of soil. It should be remembered that not only is superfluous pruning inimical to fruiting, but it also means a greater outlay on labour than is necessary.

When varieties of the gross type get into the fruiting state the weight of the fruit, by depressing the branches, acts as a natural check on growth.

The Effects of Grass.

During recent years there has been a considerable movement in the direction of breaking up turf, which scientists have shown to be harmful to young trees, although it does not prevent mature trees from maintaining health and fruitfulness. The end has been gained in Kent on a large scale by the utilisation of pigs, which root up the turf vigorously. Incidentally, this gives the soil a thorough aeration, and also a manuring. The turf system was undoubtedly adopted in past years principally with the aim of economising labour, but although the remuneration of labour is higher than of yore, it is not a more serious problem, so far as the cultivation of open fruit land is concerned, owing to the development of mechanical cultivators. There can be little doubt than under large-scale commercial cultivation turf will play a comparatively small part in the future. Modern growers will keep their soil open, so that they can cultivate and feed it unhampered.

Feeding for Heavy Crops of Fine Fruit.

There is no doubt that much has to be learned with respect to the advantages of the systematic scientific

feeding of bearing fruit trees, not only in its influence on productiveness, but also on diseases. Many of these diseases, particularly canker, are directly or indirectly due to insufficient food in the soil.

The common method of manuring land for fruit trees is to feed it heavily at planting time, when the trees are young and do not need much manure, and to neglect the orchards later on, when, the trees being in full bearing, require a great deal of extra food. The best fruit land will, it is true, carry trees for many years without feeding, but less fertile ground will not do so without reduction of crop and extension of disease.

Plain mulchings of stable or yard manure alone have great possibilities. An occasional liming or chalking is worth considering. Mulchings of shoddy are excellent. Scientific feeding with artificial manures, among which basic slag, bone meal, superphosphate and sulphate of potash must be prominent, should be carefully studied. Late winter applications of chosen compounds would undoubtedly be of immense benefit to the trees, and it has to be remembered that they can be applied with great economy of labour owing to their limited bulk.

Injurious Insects and Fungi.

The ill-effects of want of feeding are not always obvious to the grower, but the attacks of insect and fungus enemies are, and consequently insecticides and fungicides are applied more frequently than manure. Even so, however, in backward districts there is still considerable neglect. The worst cases are generally

those of small growers of the old school—men who have made no attempt to keep abreast of the times. It is surprising that even in progressive Kent, there are still to be found plantations in which ground that should be valuable, in good fruit districts, is almost derelict, because it is occupied by worn-out, neglected, insect-ridden, fungus-infected trees. These cases are the exception and not the rule; still, they exist, and, harbours as they are for noxious pests, they constitute a danger to the whole fruit-growing community.

With the proper pursuance of grease-banding, and with the systematic spring use of arsenate of lead, such destructive insects as Winter Moth, Brown-tail Moth, Tortrix, March Moth, Figure-of-8 Moth, Lackey Moth, Small Ermine Moth and even Codlin Moth can be kept in subjection. Sucker (*Psylla*) is probably better dealt with by a cover wash in spring of lime, salt and waterglass. A late limewash has proved efficacious against Apple blossom weevil. American blight calls for dual treatment on branch and at root, the former in the shape of a paraffin and soft-soap emulsion, the latter in the form of naphthaline or carbon bisulphide.

Turning to fungus pests, Bordeaux mixture is the prime agent for subduing scab and leaf-spot, with lime-sulphur a good second. Powdery mildew succumbs to sulphide of potassium (liver of sulphur), which is also worth trying in cases of Brown Rot.

Canker is generally due either to external injury or to lack of some particular food factor in the soil, and consequently the grower should not look to spraying but to care in handling his trees, and to systematic

feeding. The penetration of unsuitable subsoil by the roots is often the forerunner of canker.

Silver-leaf remains one of the most puzzling, as it is one of the most destructive (particularly amongst stone fruits) of the grower's enemies. In its early stages the disease is rather of a negative than a positive character—that is to say, the discoloration of the leaves is due rather to the absence of a beneficent factor than to the presence of a maleficent one ; but when the shoots actually perish, disease organisms appear in abundance in the form of long tiers of purplish scales, and unless these are promptly destroyed by fire the mischief may spread far and wide.

Inasmuch as trees sometimes recover after being apparently lightly attacked by silver-leaf, wholesale destruction at the first suspicion is not to be recommended, but certainly no action can be too prompt and decisive when the wood dies and the fungus appears thereon.

The increasing appearance of silver-leaf on fruit trees other than stones, such as Apples and Currant, and its spread on such trees as the Poplar and the Laurel, foreshadow even more trouble in the future than there has been in the past.

Growers should keep in touch with the research work which is being done at various scientific institutions.

Adjuncts to Fruit.

The extension of spraying raises questions respecting its effect on those useful auxiliaries of the fruit-grower, fowls and bees. What of the effects of poisonous sprays,

such as arsenate of lead, on poultry which are feeding beneath the trees? The reply is that fowls do not generally, if ever, devour dead caterpillars and maggots which have been brought down by poison sprays. Presumably they might do so if hard pressed by hunger, and might suffer in consequence, but no general injury results.

It is otherwise with bees. They are certainly liable to injury by poison sprays, and this should be borne in mind when the spraying of trees which are in bloom is under consideration. Only at that stage need the grower hesitate on account of the bees, which do not visit the trees at other times.

Gluts of Fruit: Retarding Market Apples by Cold Storage.

“Gluts” have long been the bugbear of growers. There are certain cases, few but significant, of Apples being retarded under a system of cold storage when the supply is plentiful, so that they can be put on the market later, when there is a scarcity.

Any structure will do for a store which is clean and sweet, and of which the temperature can be kept under control. The chambers may be made of match-boarding, with double walls 9 inches apart, the space between being packed with silicate cotton.

An electrical engine outside the chamber, and a connected set of coils in the open air, are the principal external mechanical appliances. Carbonic acid gas is compressed by the engine in the coils. The gas passes thence to an inner series of coils, expanding on the way.

As the gas expands it absorbs heat, thereby lowering the temperature around it. A fan draws the cooling air over the coil, and circulates it through the chamber. Thus the temperature of the chamber is lowered.

It is not desirable that the temperature should be reduced until it is below freezing point, rather should it be kept just above, then the fruit is preserved without risk.

Some amount of capital is required to instal a cold storage system, and it is obviously not adapted to the resources of small growers.

Those who are interested in the subject should read the summary of the latest methods by M. A. Monvoisin, chief of the Physical and Chemical Department of the Alfort School of the French Cold Storage Association, as published in the Bulletin of the International Institute of Agriculture at Rome.

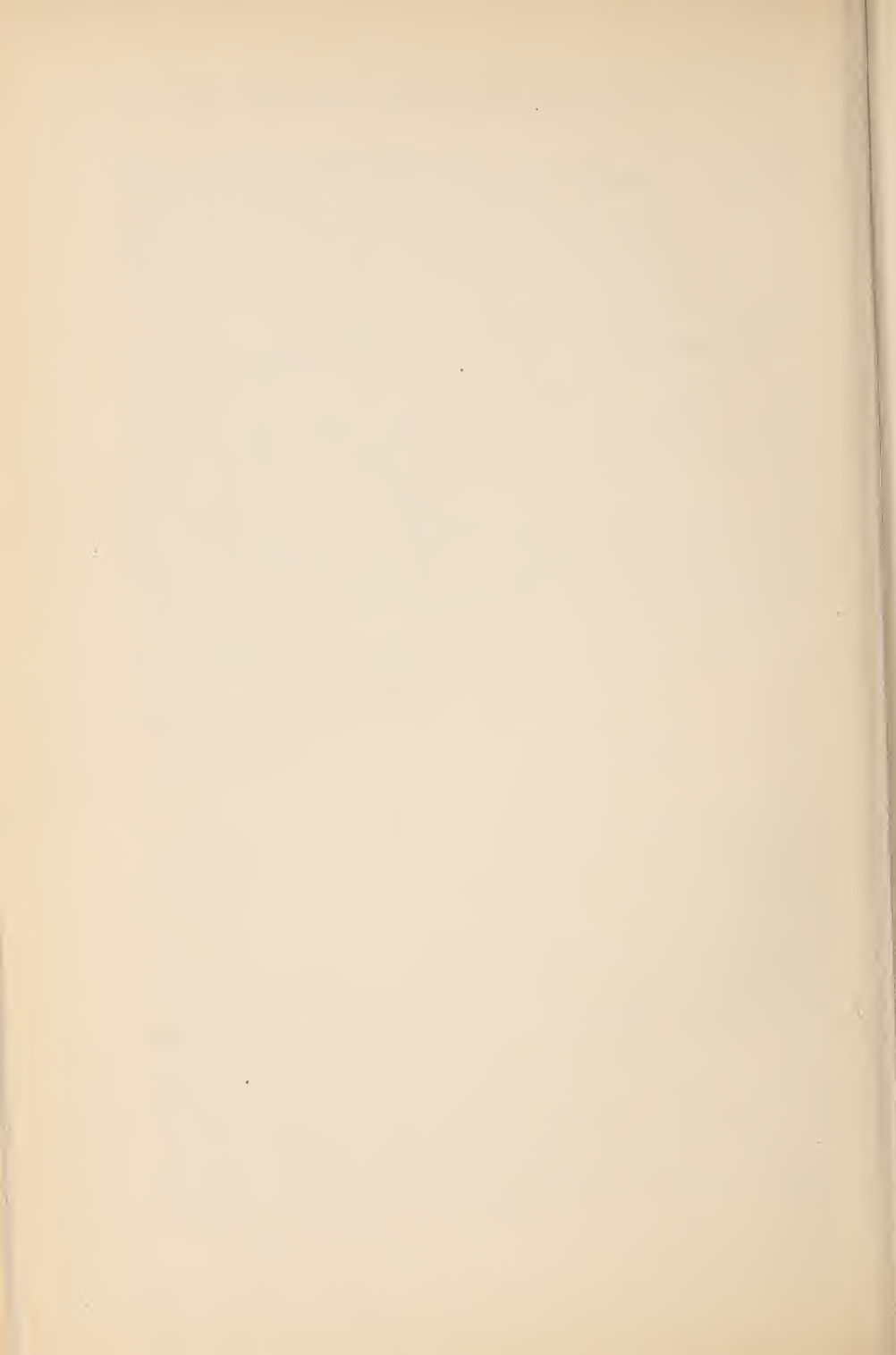
First-Class Fruit Indispensable.

The present survey of the principal factors affecting profitable commercial fruit-growing must necessarily be brief. Details on varieties, pruning, manuring, and the destruction of injurious insects and fungi must be sought elsewhere, notably in *Profitable Fruit Growing*, which is published by W. H. and L. Collingridge at 2s. net. Packing, with its concomitants, grading and marketing, is the theme of the present book. But obviously the best methods of grading and packing would be of little avail if the bulk of the fruit was inferior. When there is only one quality, and that quality bad, there is not much scope for grading. When

the great bulk of the fruit on a particular farm is poor, elaborate methods of packing are not going to make amends. The production of a high-class article is the first step, and hence the importance of giving due attention to the selection of good varieties, to site, to soil, to pruning, to spraying, and so forth.

Bad fruit is not made good by scientific packing, but good fruit is seriously depreciated by bad packing. Home fruit-growers must keep abreast of the times. They must bring every fair and honest device into play in order to hold their own against competition from Overseas, and to get their produce to the consumer in the best possible condition. Thus only will they make fruit-growing successful and profitable.

WALTER P. WRIGHT.



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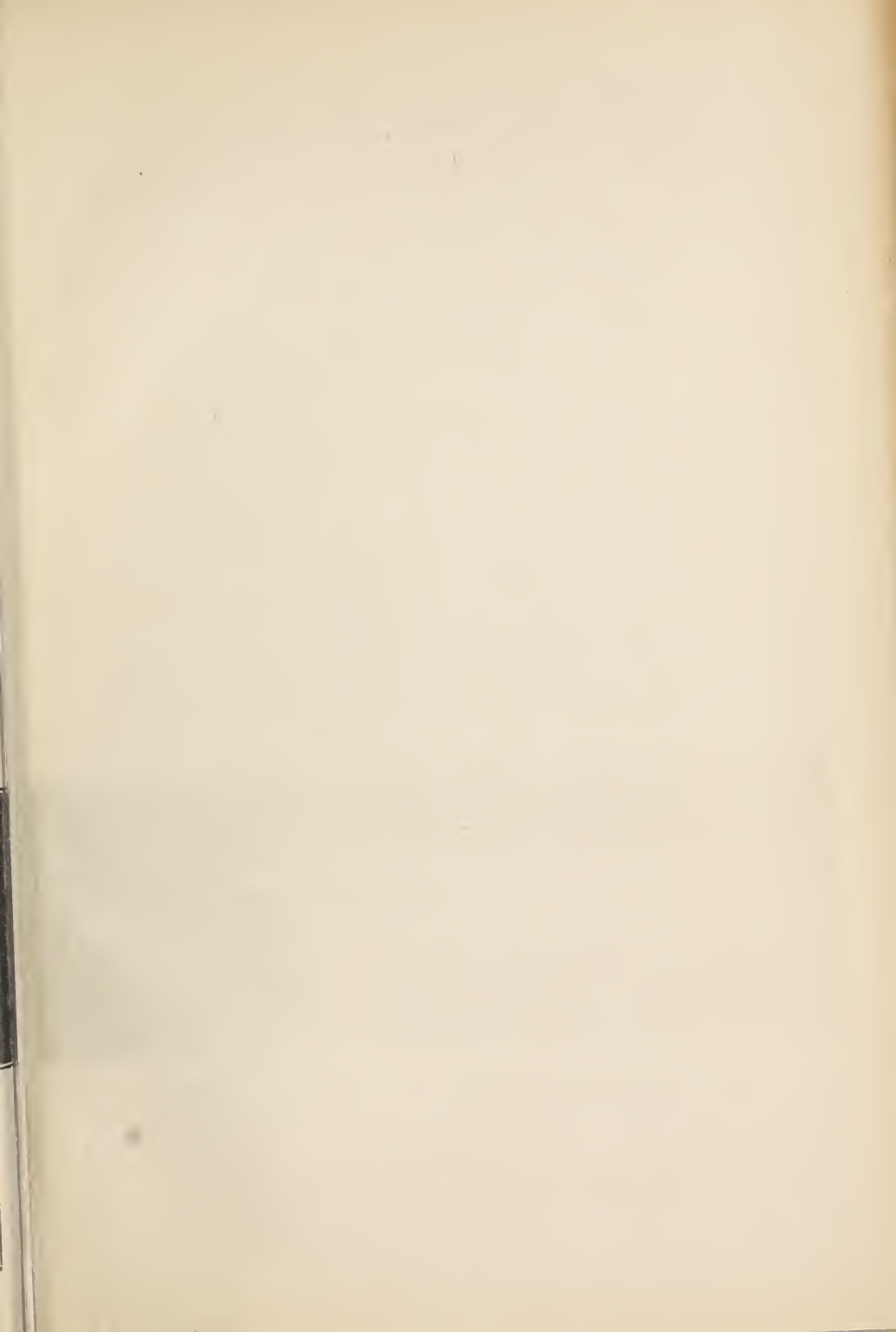
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